



FRIDAY, JULY 25.

Train Accidents in June.

The following accidents are included in our record for the month of June:

COLLISIONS.

REAR.

On the evening of the 2d a passenger train on the Atchison, Topeka & Santa Fe road ran into the rear of a freight train at Tyrone, Col., wrecking four freight cars.

On the evening of the 2d a shifting engine on the Pennsylvania Railroad ran into the rear of a freight train in the yard in Jersey City, N. J., damaging several cars.

On the morning of the 9th a freight train on the Vandalia Line ran into a preceding freight which had stopped for orders at Highland, Ill. The engine and some fifteen cars were piled up in a very bad wreck, blocking the road for a day.

Very early on the morning of the 10th a freight train on the East Tennessee, Virginia & Georgia road ran into another freight which was just preparing to back into a siding at Athens, Tenn. Both engines and several cars were wrecked. The engineer of the north-bound freight, it is said, should have stopped to see whether the siding was clear, but failed to do so for some unexplained reason.

On the afternoon of the 12th a freight train on the Buffalo, New York & Philadelphia road ran into a preceding freight near Tuscarora, N. Y., wrecking several cars. The train was a through freight composed of nine cars, and nearly all the cars which escaped this wreck were demolished in another one on the West Shore road on the following day.

On the morning of the 14th a freight train on the Buffalo, New York & Philadelphia road broke in two near Tuscarora, N. Y., and the rear section ran into the forward one, wrecking several cars.

On the evening of the 17th a passenger train on the Pennsylvania Railroad ran over a misplaced switch and into a gravel train standing on a siding at Harmerville, Pa. The caboose of the gravel train was wrecked, the engine and several other cars damaged. Five laborers who were in the caboose were hurt.

On the morning of the 18th a freight train on the Atchison, Topeka & Santa Fe road ran over a misplaced switch and into another freight standing on a siding at Osage City, Kan., wrecking several cars.

On the morning of the 18th a freight train on the Chicago, Burlington & Quincy road ran into the rear of a preceding freight near Creston, Ia. Several cars were wrecked, an engine damaged and the engineer hurt. There was a thick fog at the time.

Very early on the morning of the 20th a passenger train on the New York Central & Hudson River road ran into a freight car which had either rolled or been blown from a siding upon the main track at Port Byron, N. Y. The engine was slightly damaged and the freight car wrecked.

On the night of the 20th a freight train on the Chicago, Milwaukee & St. Paul road ran into the rear of a passenger train which had been stopped by a landslide near Lanesboro, Minn., damaging the rear car and injuring three passengers slightly.

BUTTING.

Near midnight on the 5th there was a butting collision between a passenger train and a wild engine on the New York Central & Hudson River road near Shortsville, N. Y. Both engines were badly wrecked and also the baggage car of the passenger train. The engineer of the passenger train was killed, the engineer of the wild engine badly hurt and two passengers slightly injured. It appears that the wild engine was to have met the passenger at Shortsville, but the engineer instead of taking the siding there at the west end ran up to the east end, thinking to save a little time, although he knew the passenger train was about due.

On the morning of the 6th there was a butting collision on the Denver & Rio Grande near Husted, Col., between a passenger train and a wild engine. Both engines were badly damaged and one of the engineers was hurt. It is said that the engineer of the wild engine was running on the time of the passenger train, but thought he could reach the next station before meeting it.

On the evening of the 6th there was a butting collision between a passenger train and a yard engine on the Galveston, Houston & Henderson road in Houston, Tex. Both engines were damaged and two trainmen slightly hurt.

On the morning of the 14th an excursion train on the Camden & Atlantic road met the regular passenger train on a curve near Haddonfield, N. J. At the point at which the accident took place the road is bounded on one side by a dense growth of timber, which prevents the engineer from seeing the track for more than 150 yards ahead. Both trains were running at a considerable speed, and the wreck was complete, both locomotives being almost entirely destroyed, while both baggage cars and two passenger coaches were piled up on top of them in a terrible wreck. Six of the trainmen, including both engineers, and two passengers were killed at once, one of the passengers being the Civil Engineer of the road. Three trainmen and five passengers were seriously hurt and a number of others were slightly bruised and scratched. The cause of the accident is said to be the failure of the engineer of the regular train to stop at the preceding station, Ashland, where he had received orders to await the excursion train. Why he did not stop is, of course, unknown, as he was killed, but the conductor states that he received the orders and was positive that the engineer understood them.

On the evening of the 19th there was a butting collision between a pay train and a freight train on the Philadelphia & Atlantic City road near Blue Anchor, N. J. Both engines were wrecked and an engineer and fireman hurt badly.

On the night of the 19th there was a butting collision between a passenger and a freight train on the Canadian Pacific road, near Papineau, Que. Three trainmen were killed and seven passengers injured.

On the afternoon of the 22d there was a butting collision between two freight trains on the Grand Trunk road near Welland, Ont., caused, it is said, by a dispatcher's mistake. A brakeman and a fireman were killed, and another fireman and engineer badly hurt. The conductor was missing after the accident, but it is believed that he was not hurt, but ran away.

On the morning of the 23d there was a butting collision between a passenger train and a wrecking train on the Northern Central road near Shamokin, Pa. Both engines were badly wrecked, the fireman, the train dispatcher, who was riding on the wrecking train, and a tramp, who was stealing

a ride on the baggage car of the passenger train, were killed. The engineer of the wrecking train was badly hurt.

CROSSING.

On the afternoon of the 17th a passenger train on the Canada Southern road ran into a switching freight train on the New York, Lake Erie & Western track at Tonawanda, N. Y., where the tracks cross, doing some damage.

DERAILMENTS.

BROKEN RAIL.

On the morning of the 20th several cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track near Olmstead, Ill., by a broken rail.

BROKEN BRIDGE.

On the afternoon of the 26th, on the Terre Haute & Logansport Division of the Terre Haute & Indianapolis road, a wooden truss bridge over the Wabash River gave way under a freight train, the engine and several cars going down into the river. The engineer, fireman and a brakeman were killed, a conductor and another brakeman badly hurt. The dispatches do not give a very definite account of the manner in which the bridge gave way, but it is said that it was old and had been considered doubtful, if not positively unsafe, for some time.

On the morning of the 29th, on the Virginia Midland road near Lynchburg, Va., an express train approaching the bridge over the James River did not stop or slacken speed, owing, it is said, to the failure of the air brakes to work. The train entered the bridge at very high speed and the smoking-car lurched so that its forward end struck the truss on one side. The car was thrown from the track and dragged over the ties for about 100 ft., when one span of the bridge gave way and went down into the river, carrying two sleeping-cars with it. The only person injured was the conductor. The passengers went down with the cars but were all rescued either through the windows or by holes cut in the car roofs. The dispatches do not give any particulars relating to the construction of the bridge.

On the afternoon of the 30th a construction train on the Chicago, Burlington & Kansas City road broke through a bridge over Grand River, near Sumner, Mo., and the whole train went into the river. Two laborers who were riding on the train were killed at once, 10 others are missing, and 5 were badly injured. The missing men are supposed to have been drowned, and the bodies of most of them were found. The bridge, as imperfectly described in the dispatches, was a temporary wooden structure put up for use in building an extension of the road.

SPREADING OF RAILS.

On the morning of the 10th the engine and baggage car of a passenger train on the Hartford & Connecticut Valley road were thrown from the track on a bridge in Hartford, Conn., by the spreading of the rails. The engine went off the bridge and was badly damaged; the engineer and fireman were hurt.

On the morning of the 11th a freight train on the Memphis & Charleston road was thrown from the track near Paint Rock, Ala., by the spreading of the rails. Ten cars were wrecked and two trainmen very badly hurt.

On the afternoon of the 12th a passenger train on the Home Avenue (suburban steam) road was thrown from the track near Dayton, O., by the spreading of the rails. Three trainmen and three passengers were hurt.

On the morning of the 14th a construction train on the Louisville, New Orleans & Texas road was thrown from the track near Beaver Dam, Miss., by the spreading of the rails. Two men were slightly hurt.

On the afternoon of the 17th a freight train on the New Brunswick Railway ran off the track near Bath, N. B., and the engine went down a bank dragging several cars after it. The fireman and the engineer were very badly hurt. It is said that the accident was caused by the spreading of the rails, owing to too little allowance having been made for expansion in laying them.

On the morning of the 18th a construction train on the Ohio River road was thrown from the track near Woodland, W. Va., by the spreading of the rails. A laborer was killed and another one very badly hurt.

On the morning of the 20th several cars of a freight train on the Cincinnati, Richmond & Fort Wayne road were thrown from the track near Collett, Ind., by the spreading of the rails.

BROKEN WHEEL.

On the evening of the 12th six cars of a freight train on the Chicago, Burlington & Kansas City road were thrown from the track near Browning, Mo., by a broken wheel and badly wrecked. A tramp who was stealing a ride was killed, and another one hurt.

BROKEN AXLE.

On the morning of the 1st a car of a freight train on the Housatonic road, having a circus on board, was thrown from the track near New Milford, Conn., by a broken axle.

On the morning of the 14th 24 cars of a freight train on the New York, West Shore & Buffalo road were thrown from the track near Fairport, N. Y., by a broken axle. The cars went down a bank and were scattered in all directions, making a very bad wreck.

On the night of the 18th several cars of a freight train on the International & Great Northern road were thrown from the track near Laredo, Tex., by a broken axle.

ACCIDENTAL OBSTRUCTION.

About noon on the 6th a wrecking train on the Denver & Rio Grande road struck a push-car loaded with tools which some trackmen had left on the track near Colorado Springs, Col. The engine was thrown from the track and badly damaged.

On the afternoon of the 16th a freight train on the Northern Pacific road was thrown from the track near Palouse Junction, Wash., by a log of wood which had fallen on the track from a car, and 16 cars were badly wrecked. A passenger who was riding in the caboose was killed and two tramps who were stealing a ride on a lumber car were hurt.

WASH-OUTS AND LAND-SLIDES.

On the morning of the 10th a freight train on the Indianapolis & Vincennes road ran into a land-slide near Martinsville, Ind. The engine was thrown from the track and the engineer hurt.

On the night of the 14th a freight train on the Atchison, Topeka & Santa Fe road ran into a wash-out near Las Cruces, N. M. The engine and several cars were wrecked, and a brakeman was drowned.

On the morning of the 17th a repair train on the Atchison, Topeka & Santa Fe road ran into a wash-out near Riecon, N. M., and sunk down at once out of sight, being covered by nearly 20 feet of water.

On the afternoon of the 22d a water spout struck the Norfolk & Western road at a cutting near Big Tunnel, Va., just as a passenger train was passing. A great body of water poured into the cut, washing down earth and rocks, which threw the engine from the track. The car windows were shattered until the water poured into the cars in great volumes, flooding the floors to a depth of several inches. The passengers were much frightened, but there was no escape. Waterfalls poured over the sides of the cut, and the

track was submerged to a height of several feet. The conflict between the clouds was short and sharp, and after letting down the immense volume of water they contained they cleared away, leaving in view the work of destruction they had caused. The engine was covered with mud and the fire put out, the cars were pelted and splashed outside and deluged inside, while the passengers sought the driest spots possible.

MISPLACED SWITCH.

On the evening of the 1st the engine of a freight train on the Boston, Hoosac Tunnel & Western road was thrown from the track near Mechanicsville, N. Y., by a misplaced switch.

On the morning of the 10th a passenger train on the East Tennessee, Virginia & Georgia road was thrown from the track at Adams Park, Ga., by a misplaced switch, blocking the road several hours.

On the night of the 12th a passenger train on the Chesapeake & Ohio road was thrown from the track in Richmond, Va., by a misplaced switch. The engine was badly damaged, the engineer killed and the fireman hurt.

On the afternoon of the 14th the engine of a freight train on the Lehigh & Hudson River road was thrown from the track in Graycourt, N. Y., by a misplaced switch.

On the morning of the 19th the engine of a passenger train on the New York, Lake Erie & Western road was thrown from the track in Paterson, N. J., by a misplaced switch.

On the evening of the 23d the engine and one car on a passenger train on the Toledo, Cincinnati & St. Louis road was thrown from the track near Wellston, O., by a misplaced switch.

Very early on the morning of the 26th the engine and two cars of a freight train on the New York Central & Hudson River road were thrown from the track near Albion, N. Y., by a misplaced switch.

On the afternoon of the 30th a passenger train on the New York, Providence & Boston road was thrown from the track in Stonington, Conn., by a misplaced switch.

RAIL REMOVED FOR REPAIRS.

On the afternoon of the 27th a bridge over White River, near Indianapolis, Ind., on the Cincinnati, Indianapolis, St. Louis & Chicago road, gave way under a freight train. The best account of this accident appears to be that some trackmen who were repairing the track on the bridge had taken up a rail and in putting out their signal had not made sufficient allowance for the heavy grade on the approach to the bridge. The freight train was unable to stop, and on reaching the place where the rail had been taken out left the track and was thrown over against the bridge truss. The shock threw down two spans of the bridge and the engine and ten cars went into the river. The bridge was a Howe truss wooden structure and is said to be in very good condition, but the truss was unable to withstand the shock which it received when the engine was thrown against it.

MALICIOUS.

On the night of the 11th a passenger train on the Cincinnati, Washington & Baltimore road was thrown from the track near Loveland, O., at a point where a rail had been removed from the track, apparently for the purpose of derailing the train. A colored man living in the neighborhood was arrested and has since been tried, but it was impossible to prove the wrecking against him.

On the night of the 17th a train on the Atchison & Nebraska Division of the Chicago, Burlington & Quincy road was thrown from the track on a bridge near Hubbell, Neb., where a joint had been removed and a rail misplaced by some persons unknown. The train was running at a considerable speed and the night was very dark, so that the engineer did not see the misplaced rail until just as he struck it. The engine ran across the bridge on the ties and for some distance beyond and then rolled over down a high bank some 40 ft. The baggage car, the express car and the smoking car followed the engine down the bank, the baggage car being underneath, with the smoking car on top of it. The baggageman was fatally hurt, the engineer and the conductor badly injured, and 15 passengers more or less severely hurt. The train wreckers seem to have gone to work deliberately, as it was afterward found that a fish-plate had been removed and the spikes taken up for the whole length of the rail, and a barbed wire, taken from a neighboring fence, passed down through the bridge and to the bank below a distance of nearly 60 ft., in a way which seemed to indicate that the wreckers had removed the plate and spikes, attached the wire and afterward laid in wait below and pulled the rail out of place when the train was so close that there was no possibility of stopping it. No clue was obtained to the wreckers.

Very early on the morning of the 24th a freight train on the Richmond & Danville road struck some ties which had been piled up on the track near Durham, N. C. The engine and several cars were thrown from the track, and the engineer and fireman were both badly hurt. The obstruction was placed on the track at a curve where it could be seen only a very short distance. No clue was obtained to the train wreckers.

On the night of the 25th a passenger train on the Lake Shore & Michigan Southern road struck some ties which had been piled up on the track near Dunkirk, N. Y. The engine was thrown from the track, but very little damage was done, the engineer having seen the obstruction in time to put on the brakes and stop the train.

On the night of the 26th a passenger train on the Texas & St. Louis road was thrown from the track near Winona, Tex., by some ties which had been piled on the track and chained down to the rails. The whole train was thrown from the track, but no very serious damage was done. A colored man was captured in the bushes close by and carried to the next place, where he narrowly escaped lynching.

UNEXPLAINED.

On the morning of the 2d several cars of a freight train on the Pennsylvania Railroad ran off the track near Marlon, N. J., delaying travel for an hour.

On the evening of the 2d some cars of a freight train on the Richmond & Petersburg road jumped the track in Richmond, Va., blocking the road for some time.

On the morning of the 5th the engine of a freight train on the New York, Lake Erie & Western road ran off the track in Jersey City, N. J., delaying trains some time.

On the evening of the 8th a construction train on the Pittsburgh, Cleveland & Toledo road jumped the track while running backwards near Akron, O. A caboose car, containing a number of Italian laborers, went down a bank with several flat cars piled up on top of it. Seven men were badly injured and six others less severely hurt.

On the morning of the 10th three cars of a freight train on the Philadelphia & Reading road were thrown from the track near Bern, Pa., and badly damaged.

Very early on the morning of the 11th a car of a freight train on the New York Central & Hudson River road ran off the track at Holly, N. Y., blocking the road several hours.

On the afternoon of the 17th some cars of a coal train on the New York Central & Hudson River road ran off the track in Buffalo, N. Y., doing some damage.

On the morning of the 18th a construction train on the

make a tire. It is then lifted out by the crane and swung around and put into another cast and the cast-iron poured inside it. When broken up, the union of the two metals is always found as near perfect as possible.

Mr. W. B. WARREN (Indiana, Bloomington & Western): I have nine locomotives fixed with the Allen paper wheel, and my experience is that there are no more sharp flanges than on the cast-iron running on the same roads in proportion. There is little difference in the cost of running as

cago, St. Louis & Pittsburgh) moved that the report of the committee be accepted, and that they be continued with instructions to recommend at the next meeting some form of brake shoe and brake head for discussion and adoption.

Mr. MARDEN (Fitchburg), would recommend the Christie head and shoe.

Mr. WALL wished to recommend something that will be adopted by all parties.

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therefore, it is somewhat weaker than the plan shown in Fig. 1, while the angle-irons would somewhat impede the circulation. We believe, also, that this method is not entirely new, having been used to a small extent some twenty-five years ago.

Contributions.

Wheel Gauge and Track Gauge.

MANSFIELD, O., July 8, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in the paper read by M. N. Forney at the Convention of Master Car-Builders, that it was claimed that one of the difficulties which stood in the way of the Master Car-Builders in adopting a uniform gauge for car wheels was that those in charge of permanent way had not agreed upon any uniform practice for gauging track, locating frogs and guard rails. Now, according to reports received from 80 different roads, there is a difference of $\frac{1}{4}$ in. in the space allowed between the guard rail and main track rail, against $1\frac{1}{4}$ in. difference in the gauge of wheels of only 13 of the roads in the country; and on account of this $\frac{1}{4}$ in. difference in the space allowed guard rails, which no doubt is intended as a factor of safety to guard against the difference existing in the gauge of car wheels, the Master Car-Builders claim that they cannot act intelligently in adopting a standard gauge. This is the only thing on permanent way that can in any way interfere with the gauge of the wheels, and is an easy matter to remedy after a uniform wheel gauge is once adopted, which it is hoped will greatly reduce the number of wheels broken, axles bent, and the dangerous and expensive accidents caused by them.

It has been my practice during an experience of 20 years on track not to increase the width of the gauge in curves under 4°, and to elevate the outer rail $\frac{1}{4}$ in. per degree for a rate of speed of 35 miles per hour, and $\frac{3}{4}$ in. per degree for 50 miles per hour. I also maintained a uniform rule for placing guard rail, by allowing 2 in. between it and the main track rail. This practice I have every reason to believe has worked well, because I never had a wheel off the track caused by a frog, guard rail, imperfect gauge, or imperfect elevation of curves on any of the six roads that I have been connected with.

M. J. MCINAINA,

Road-master N. Y., Pa. & O. R. R.

Standard Bridge Floors.

MUNICH, BAVARIA, June 22, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I see you have done me the honor, in your issue of June 6, to publish a summary and friendly criticism of my paper on "Bridge Floors."

As I am mentioned as the Chief Engineer of the Chicago, Burlington & Quincy Railroad, it seems necessary to explain that I am no longer connected with that road, and never was its Chief Engineer.

I would also like to explain that my design was for a floor cheap enough to make it appear reasonable to use it for all openings large enough to cause serious disaster in case of derailment, and yet affording practically all the protection needed.

The 5-in. clear spacing was rather a maximum than a minimum, though, as you say, much closer spacing would require a change in the design. I referred, in discussing this point, to the cutting of the wheels into the tie edges, which is decidedly important in this connection.

Two inches seems to me practical, all things considered, and is less than the standard of many, if not of most, well-conducted roads.

Protection to track-walkers can be provided more cheaply by extra attachments than by increasing the length of the large and closely spaced bridge-ties, and without affecting the design for the bridge floor proper.

As to the rerailing devices, I felt that the generality I aimed at excluded more than the mention I gave them, as few railroad men would consider them worth applying to all openings, and both Mr. Latimer's and Mr. McClure's would be, generally speaking, mere additions to such a floor as I propose.

W. HOWARD WHITE.

Spacing Cross-Ties.

PITTSBURGH, Pa., July 7, 1884.

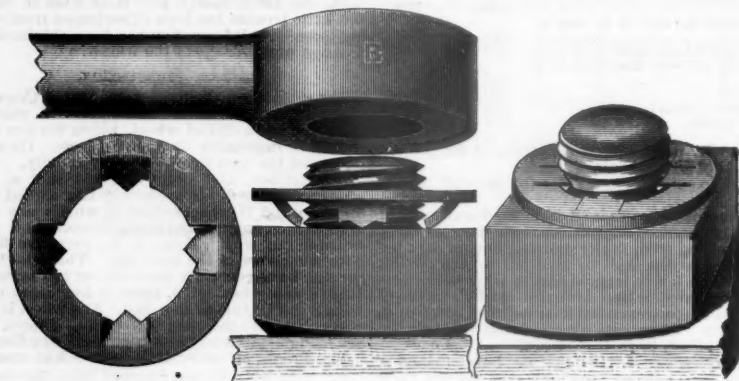
TO THE EDITOR OF THE RAILROAD GAZETTE:

I think your circular relating to "nut locks, even or broken joints and cross-ties" should have included a question asking "What distance apart are cross-ties generally spaced apart centre to centre?"

The prevailing practice seems to be to space them a certain distance apart "centre to centre."

Now, in my opinion, this practice is radically wrong, for this reason: that, with cross-ties of varying widths, it leaves unequal spaces between the same, they varying, of course, with the width of the ties.

The specifications of most railroads requires ties having a face of not less than 8 in. wide. Now, if the ties are spaced 24 in. centre to centre then this space between supporting edges is 16 in., with 10-in. ties the space is reduced to 14 in., and with 12-in. ties to 12 in.; and as ties are often put in having a face of 14 in. the intervening space is further reduced, namely, to 10 in. There is no question that a large percentage of ties put in does not exceed 8 in. face, in which event a space of 16 in. would be left for ballast. Assuming that this space, then, is the proper one to leave between the ties, and considering the rail as a beam not too long a distance between supports, then it must follow that, by spacing larger ties (more than



THE VAN DUSEN NUT LOCK.

compared with the chilled wheel. The paper wheels run from 80,000 to 100,000 miles without turning. The wear is not perfectly uniform, owing probably to the quality of the material.

The discussion then closed.

The Van Dusen Nut Lock.

The accompanying illustration represents a steel nut lock, patented on April 4, 1884, by Mr. Charles Van Dusen, of New Albany, Ind. The lock is placed above the nut and is pressed flat, so that the teeth engage with the thread of the bolt by striking a blow with a hammer on the "set" shown in the upper part of our illustration.

As the lock is forced down upon the nut by comparatively light blows of a hammer, the tongues have a knuckle-joint-like motion which force the teeth into the metal of the bolt, making a fastening which is both positive and secure. One novelty in this nut lock is the way in which it attacks the difficulty to be overcome, viz., from outside the nut, which is the natural place to look for the opposition to the removal of the nut. Inventors heretofore seem to have devoted their attention almost entirely to devices operating from below the nut or to one side of it.

This nut lock can be applied under any circumstances, provided there is at least one thread beyond the nut, which is claimed to be an advantage over those requiring two bolts to be an exact distance apart, or those having a thick washer under the nut. This nut lock is cheaper than most of those in use, and incidentally a great saving is claimed by the use of shorter bolts, more than one-half to three-quarters of an inch being saved where the Van Dusen nut lock is used instead of a joint nut. It has already been tested severely enough to show its good holding qualities. It is manufactured by the Peerless Manufacturing Co., of Louisville, Ky., who will furnish any further information.

In reply to the circular which we have issued asking for the experience of those engineers having charge of permanent way in regard to nut locks, and laying a road with opposite or broken joints, we have received the following letter from the Engineer and Superintendent of Road Department of the Louisville, New Albany & Chicago Railroad:

"I consider the Van Dusen nut lock the only sensible nut lock I have ever seen, as it is applied to the part of the bolt where it should be, and locks both the bolt and nut together."

"On a well-ballasted road it should make no difference which method of laying rails is used. I prefer the even joints with strong suspended joint splices."

(Signed,)

J. B. PEARSON."

Freight Car Roofs.

The following is an abstract of the discussion which took place on the report of the committee appointed to investigate the above subject. The report will be found on page 457 of the *Railroad Gazette* of June 20, 1884:

Mr. KEELER (Flint & Pere Marquette) moved that the report be received and the committee continued another year.

Mr. MILLER: Instead of a double board roof we use a composition of pine tar, rosin oil, and refuse from the salt works at Saginaw (which will not evaporate), placed in between the courses of boards. We can thus use a cheap class of lumber, provided it has sound knots; loose knots cannot be used. It has worked very satisfactorily on 1,000 cars.

Mr. McILWAIN thought nails driven in are equally as good as screws as at present used.

The PRESIDENT asked if any still used screws.

Mr. BISSELL thought the barbed nail as good as a screw turned the right way.

The motion was carried and the discussion closed.

Brake Shoes, Brake Beams and Interchangeable Car Brakes.

The following is an abstract of the discussion which took place at the late Car-Builders' Convention on the report of the committee appointed to investigate this subject, which will be found on page 458 of the issue of the *Railroad Gazette* for June 20, 1884:

Mr. WALL (Pittsburgh, Cincinnati & St. Louis, and Chi-

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therefore, it is somewhat weaker than the plan shown in Fig. 1, while the angle-irons would somewhat impede the circulation. We believe, also, that this method is not entirely new, having been used to a small extent some twenty-five years ago.

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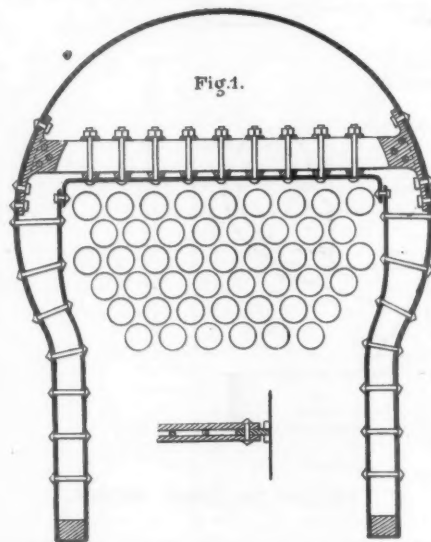


Fig. 1.

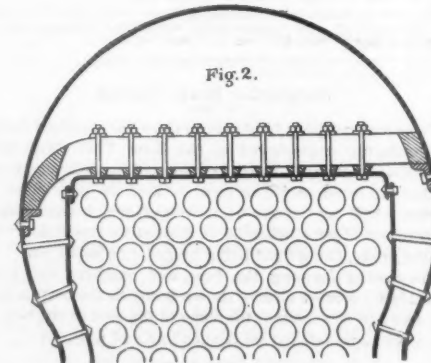


Fig. 2.

Griggs' Improved Crown Bars.

or side-sheets of the boiler, the fire-box being supported and the fire-box casing kept in shape without any links, braces, or stay-rods. This gives a clear space above the fire-box, which is very convenient for examining, cleaning or repairing.

Fig. 2 shows the ends of the bars resting on angle-irons secured to the sides of the casing. In this case the crown-bars do not tie the two sides of the wagon-top together, and,

8 in. face) so as to leave a smaller space between them, there is, necessarily, a great waste of material—much more so than is generally supposed.

In order to show what can be saved by spacing ties a fixed distance between edges, instead of from centre to centre, I have constructed the following table:

Ties 8 in. wide, spaced 16 in. between edges, No. per mile,	2,640
" 10 " " " " " " " " " "	2,437
" 12 " " " " " " " " " "	2,263
" 14 " " " " " " " " " "	2,212

By spacing the 10-in. ties by the method suggested by me the saving per mile would be 203 ties, which at 50 cents apiece would be \$101.50; with the 12 in. ties this saving would be 377 ties, which at the same price would be \$188.50; with the 14 in. ties we save 428 ties, or \$214 per mile.

Now no one will gainsay but what this would be an enormous saving, providing of course that my assumed distance between edges is the correct one, and I have every reason to believe that it is so, being based on frequent observations and measurements.

EMILE LOW.

[Doubtless a good many questions which would have been of general interest if fully answered could have been asked in our circular; but if they had all been asked at once the circular would have been too long to receive the full response which it has called out. The suggestions of this and other correspondents will be borne in mind for further use.—EDITOR RAILROAD GAZETTE.]

Why the New Haven Cars are Uncomfortable.

TO THE EDITOR OF THE RAILROAD GAZETTE:

That the passenger coaches recently built by the New York, New Haven & Hartford Railroad Co. are very uncomfortable, particularly in hot weather, is known not only to the patrons, but to nearly every sub-official of the road. The difficulties are of a nature to escape the attention of the higher officials, who ride in special and drawing-room cars, except, perhaps, through occasional fizzes of supposed "cranks," who are always growling, and who, like other people, will not take the time to try rationally to overcome difficulties. The popular outcry is chiefly caused by the fact that the windows can only be opened three inches, and as concessions are now being made on this point by omitting the stops on the few new cars now being issued—without great improvement in ventilation, however, and with little prospect of helping the sweltering numbers who must use the original cars of the type on all local trains—it is thought proper, in the best of good feeling, to point out the true nature of the difficulties, part of which will be found to apply to the coaches of other roads.

First be it said, that the New Haven road has improved greatly of late years. The officers apparently intend to make it a first-class road, but that takes time. It can hardly be expected to use anthracite coal for fuel, till the light original engines are displaced, and the undulations and short curves in the road cannot be changed in a season. New work could, however, be made right, and it was evidently intended that the new coaches should be the best in the country, as they are in some respects the handsomest. They are high, and finished throughout with mahogany. The windows are wide and high, and above them are lights of stained glass of less depth, swiveled to act as ventilators. The lights in the clearstory, or upper portion of the cars, are also of stained glass, hinged alternately at front and rear, and arranged to form the ordinary suction, induced-current ventilators. The lower windows are shaded by rich curtains on roller fixtures, and an ingenious arrangement is provided by which the lower rod operates in notched grooves in the window jambs to hold the curtain at various heights. The stained-glass windows above the main ones are thus left uncovered, and the general effect of the hard finish with windows and curtains is quite good. The lower windows will raise about a foot when the upper ones are closed; but stops were inserted in all the cars until recently to prevent raising main windows more than three inches. The effect is this: In the depots or on a sultry day the air supply under the windows is too small to satisfy anybody, and when the train is in motion, the suction ventilators at the top of the car draw air with a rush through the slit, cutting the lower part of a person's lungs to the quick, thus forcing sensible people to close the windows at once. In the few cars sent out since the general outcry one can be comfortable when they are at rest, but windows must be closed to keep out the rush of cinders when the train is in motion. The general result is that the suction ventilators draw air through the ventilators over the windows, the air passing from one to the other with little comparative relief to the passengers, and showering fine cinders from above on their necks and bosoms. When all the ventilators are open there is some change in the air below, but when the dust begins to fall on the knowing-one's newspaper, he rises and shuts the ventilator over his seat, also the one over his neighbor in front. Others follow suit; the currents rush fast through the remaining openings, and larger cinders fall below them, and those ventilators are shut, so the cars soon become gorgeous sweltering boxes, with here and there one person opening a window to cover the one behind with dirt.

One great fault with the ventilation of these cars, common to many others, is in the use of the exhaust ventilators in the clearstory. In drawing in air at every opening they must also draw in cinders. Pullman and some other builders do not use them, but, strange to say, many fail to see that the system is wrong. A car may be ventilated by simply putting plenty of large openings at the top, and in summer opening the windows when necessary. No suction devices

are admissible, as they draw in the dust and cinders. When they are omitted, so that it is possible to open windows, a lateral wind blows through the car freely and keeps the cinders away from the train.

The New Haven cars can be made comfortable by hinging the upper sash horizontally, so that they will be neutral—that is, will produce no suction—protecting them outside with wire gauze and taking the stops off the windows. The ventilators over windows are worse than useless, and should be shut and screwed fast. The curtains are also a mistake, and should not be used on new cars. On "the sunny side" they get perceptibly hot to the touch. The usual slats are better, as they do not get hot, and do not cut off ventilation through the windows. Again, the elaborate projecting handles on the windows are a mistake, as they come exactly where one wishes to rest his arm. The old-fashioned, low, scoop-shaped handles were good enough, and are not uncomfortable.

All changes are not improvements, and it is unfortunate when an evidently able man lets the maggot of invention burrow in his flesh so as to thwart his judgment. That the results desired can be accomplished by rejecting all novelties is certain. I have in the late spell of hot weather ridden in a Pullman car with neutral ventilation with nearly all the windows up, without discomfort, and, on the same day in a coach with boxed exhaust ventilators which the conductor turned against each other so as to make them neutral, with the same result, and then came to the New Haven road and suffered extremely. Strange to say, many of the old cars of the New Haven road have neutral ventilation, and are quite comfortable, though it would be better to swing horizontally every one of the upper sashes instead of alternate ones. With this slight change, cars of the type of No. 104 are good enough for any road. Some of these old cars have both neutral and exhaust ventilators, which latter neutralize the former; and others again have had the sash forming neutral ventilators screwed fast, and are almost as bad as the new cars. All cars can be made comfortable by turning all the upper sashes horizontally, and taking off the deflectors and patent devices. This is shown on a cool day when occasionally the exhaust ventilators of one of the new cars are shut. The ventilators over the windows then act as they would in the upper part of the car, though less efficiently.

The idea of fastening down windows to prevent injury to the persons of passengers will never be popular, as it infringes personal liberty and spoils proper ventilation in hot weather. If protection must be had, the gratings used on the local cars of the Reading road are preferable, and I really think they could be applied so as not to be seriously objectionable. Some wag would, however, suggest the use of barbed wire as a method of showing that safe-guards which restrain personal liberty will never be popular.

CHAS. E. EMERY.

The Tests of the Harkort and Keystone Steel Girders.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the *Railroad Gazette* of May 2 you publish a criticism by Mr. C. B. Bender of my paper entitled "Experiments on Steel and Iron Riveted Girders, and Remarks on the Tests made by the Dutch Government." The article by Mr. Bender escaped my notice at the time of its publication, and my attention was only recently called to it. I beg that you will now afford me space for a reply.

For the sole reason that the results of the Keystone Bridge Co.'s experiments are at variance with the results obtained with the Dutch girders, Mr. Bender insinuates that the former were made by a party in interest and for a purpose. If Mr. Bender believes that a company doing a very extensive business in the building of bridges, and of long established reputation, can afford to advocate the use of unsafe material for the structures it builds, his views are peculiar. The Keystone tests were made to throw light upon the Harkort experiments, and to find out whether similar results would be obtained if the steel in each girder was more nearly homogeneous than it was supposed to be in the Harkort girders.

Far from trying to obtain the best results possible, the hard steel used was so high in phosphorus (0.175 per cent.) that it would have been rejected as unsuitable material for bridge purposes under ordinary American inspection. Further than this, two of the steel girders had the rivet holes punched without reaming, and yet the Keystone Bridge Co. has always reamed the rivet holes in the steel bridges it has built, and maintained the advisability of adhering to this practice. Excepting a small lot of bridges for which a very mild grade of steel, or "ingot iron," was used, of 60,000 lbs. ultimate strength, the company has not used steel for bridge members which are subjected to bending strains, either before or since these tests of girders, and it could not therefore have derived any pecuniary benefit from the tests. The steel bridge members which it has built were the heavy compression members, such as the top chords, and tension members in the form of eye-bars.

The five girder tests were made in the presence and with the assistance of two inspectors for railroad companies who were entirely disconnected with the company, and invitations to be present were sent to engineers resident in the city.

Mr. Bender to the contrary notwithstanding, I have not claimed for these five tests that they proved one thing or another as regards steel. I consider that so small a number of tests can only furnish a link in a chain of evidence—nothing more.

I did not question the accuracy or the correctness of the

Harkort experiments, but I said they required explanation, and that "in the form in which they have been made public" they "are an enigma from which conclusions of any kind cannot be drawn." Mr. Bender and, according to his account, the Dutch government engineers concluded from these experiments that steel is unfit for use in bridges, at least in the form of girders subjected to transverse or bending strains, and this view I hold to be unfounded. I did question the uniformity of the steel in the girders, and neither the presence of a number of gentlemen to witness the tests of the girders nor the reputation of the works which furnished the steel, nor Mr. Bender's general statements about the severity of Dutch inspection are evidence to the contrary.

The Keystone Bridge Co. has at various times made tests of full-size steel eye-bars manufactured by upsetting and annealing. By thorough inspection of the steel at the place of manufacture, testing every melt, and by proper manufacture into the finished bar at the bridge works, it was found that excellent results could be obtained, that the eye-bars showed great uniformity in ultimate strength, elastic limit, ductility and elasticity. Why should not equally good results be obtained with steel girders, if the material is equally uniform? I can find but one explanation (Mr. Bender does not offer any other), for the poor results obtained with the Harkort girders, viz., want of uniformity of the steel, and this would account fully for their behavior. I leave out of the question possible shortcomings in the manufacture of the girders themselves. The manner in which many of them failed, one angle or plate in the tension flange breaking first and the remainder some time afterward, ten of the girders actually showing fracture in one part of the tension flange at a lower centre pressure than that which caused entire rupture, this, if anything, is evidence of a want of uniformity in the material composing each girder. Practical uniformity, however, can be obtained by inspection; and I therefore concluded that the fault lay in the "omission of the necessary precautions to secure proper material," which Mr. Bender calls a "gratuitous remark." Again, the fact that the angles in the girders were not tested at all does not argue for thoroughness of inspection. Mr. Bender thinks "there is no harm in this, because the angles were made of the same material." Very likely. They were steel, too, but of what grade?

Specimen tests are needed to determine this; the manufacturer's classification is not sufficient. It requires but a fraction of 1 per cent. in the amount of carbon contained in the steel to produce differences in its physical properties greater than those exhibited by cast and wrought iron. If one angle of the tension flange of a girder were cast-iron and the other angle and the flange plate wrought iron, would any one expect good results? The cast-iron angle would break first, after which the wrought-iron would fail at a higher centre-pressure than that which ruptured the cast-iron. This would correspond exactly to the manner in which a number of the Harkort girders actually failed.

If by proper inspection the steel angles and plates had been practically of the same ultimate strength, elastic limit, elasticity and ductility for each girder, would the result have been as poor as obtained for the Harkort girders? The four steel girders tested by me are simply so much evidence that such would not have been the case, that is all.

The tests on small specimens contained in my paper were made in an Olsen lever machine of 50,000 lbs. capacity. The pressure in the hydraulic machine of the Keystone Bridge Co. in which girders were tested, is measured by mercury gauges. The machine is in constant, almost daily, use, and although no systematic investigation of its accuracy has been made, sufficient tests exist on similar bars broken in the Keystone and in the government machine at Watertown to furnish a comparison and to show that the inaccuracy of the Keystone machine is not considerable—that it is much under 5 per cent. in ordinary cases. If deductions had been made for friction, the results of the tests of the Keystone girders would have been still more favorable to the steel girders, for the reason that the friction would be a smaller percentage for the higher pressures at which the steel girders failed than for the low pressure which caused failure in the iron girder. It is, therefore, unnecessary to dwell on the subject of friction. Mr. Bender seems to expect identity between the ultimate strength of a specimen tested in simple tension and the calculated fibre strain in a girder at the moment when rupture takes place. The calculation of the fibre strain rests on Navier's hypothesis, which assumes a constant modulus, and notoriously does not apply to strains beyond the elastic limit. The fibre strain calculated for these girders on this assumption cannot, therefore, be identical with the ultimate strength obtained in the specimen.

I may here correct a misprint in my paper as published in the *Railroad Gazette* of March 31, 1884. The fibre strain in the iron girder at which failure took place was 53,000 lbs. per square inch, not 58,000, as printed in the left-hand bottom corner of page 219.

Mr. Bender terms the mode of manufacture of the Keystone iron girder "the Pittsburgh process of punching holes and nailing the iron together." The Keystone girders were all machine riveted, which Mr. Bender may call nailing if it pleases him, but this does not change the fact that machine riveting is so generally admitted to be superior to hand riveting by engineers that American bridge specifications now usually call for it. If this superiority is true in iron, it is especially true in steel. Were the Harkort girders hand-riveted? Mr. Bender does not tell us. Are the poor results obtained for them to be attributed largely to faults of manufacture? I have left this question out of consideration simply for want of all information on this subject.

But this much is clear, that the Harkort girders with turned bolts in reamed holes gave better results than the girders riveted in reamed holes. Is not this evidence of poor riveting? Mr. Bender himself attributes the better results to "the influence of careful manufacture." If he must make slurring allusions to manufacturers, had he not better reserve them for his own side of the fence?

Mr. Bender tells us that in this country as well as in England and Germany "there exists a powerful combination of the steel interest, and it seems that nobody dares to publish anything but what is good about steel." This is startling information. Millions of tons of steel are used every year, and the consumption is rapidly growing. It has become indispensable to many industries, and is continually finding more extended application.

At this stage in the use of steel to maintain that manufacturers conspire to suppress information about its qualities, that the users of steel are hoodwinked by them, is an astonishing proposition indeed.

It so happens that the first prominent bridges in steel in this country, the St. Louis Bridge over the Mississippi River, the Glasgow and the Plattsmouth bridges over the Missouri River, were built of this material at the instance of their chief engineers, who were not connected with any steel or bridge works, and much to the inconvenience of the latter. For the St. Louis Bridge particularly it may be said that steel was introduced before manufacturers in this country were ready to furnish it of suitable quality; and even for the Plattsmouth Bridge much extra expense had to be incurred by the manufacturer to furnish steel that would pass inspection.

The large bridge works in this country were all originally equipped for the manufacture of bridges in wrought iron, and their owners and engineers, I take it, would gladly dispose of the steel question as Mr. Bender does by saying that "good iron is still good enough for most bridges." They would thereby save themselves expensive changes in their plant and much bother and trouble. But most engineers consider it their business and duty to build economically as well as safely; and since a great saving can be effected by the use of steel in large structures, they will take the pains and trouble to inquire into its qualities, and to use it if they find it suitable for their purpose.

How far the tests I have made will aid in this I do not undertake to say; how far they may be considered "conclusive" I have not pretended to assert, and shall gladly leave to individual judgment; that they will be of some value and with other tests furnish cumulative evidence of some kind, I sincerely hope; that others may make additional tests and publish them, I earnestly wish; that in discussing them I shall be actuated by the single desire of arriving at the truth, without insinuating bias and a purpose if the results do not agree with mine, I freely promise.

PITTSBURGH, July 1, 1884.

C. L. STROBEL, C. E.

The Plague in Long Island.

TO THE EDITOR OF THE RAILROAD GAZETTE:

While much apprehension is created by the fact that Asiatic cholera has approached within 3,500 miles of our shores, it must not be forgotten that a most annoying and irritating, though not exactly deadly plague, pestilence or pest is raging in a virulent form at our very doors. The objects of its attack are travelers by rail, mostly innocent, hard-working New Yorkers, who desire nothing less than to be conveyed to their journey's end as quickly as possible and meanwhile wish to read all Mr. Jenkins has to say about dollars and cents in peace, the subject being congenial to the mind of every good citizen of Manhattan. If the trains should by some mysterious dispensation of high, mighty and sagacious power ever start, or occasionally arrive on time, and sometimes in a fit of wild exuberance attain a greater speed than twenty miles in two hours, the weary traveler would bow his head with resignation and meekly accept such blessings, humble though they be. But no, the plague rages in spite of the most strenuous efforts of the Long Island Railroad to keep it at bay by a most complete and original system of railroad quarantine. This corporation has gone even further in its humanitarian projects to protect travelers, and has—also in a most disinterested way—endeavored to warn and deter passengers from traveling on its road. It has in the most praiseworthy manner endeavored to isolate its line from the rest of the world by running its cars from as remote a point as possible, reached only by quite a respectable voyage on the least-speedy fleet of ferry-boats within hailing distance. But unfortunately all these precautions are in vain. In vain are trains side-tracked in the lonely woods, and the first train to arrive at a junction carefully delayed until three other trains have passed; in vain are the car seats carefully filled with fine old dusty disinfecting powder, and the seat springs and window fastenings purposely broken. The pest, notwithstanding all these temptations to desist, and worry other nations, still continues to feast its hungry jaws upon its unfortunate victims. Poor suffering mortals who wish to inhale the sea breezes of, say Long Beach, are made to suffer dearly for their daring ambition. They must consider themselves fortunate should the distance from Wall street, which is somewhat under 20 miles in a bee line, be traversed in two hours, while the tedium of their weary journey is rendered unsupportable by the constantly recurring attacks of the plague. Their tempers, their pockets and their tickets are alike worn out in the struggle with the fell disorder.

Fortunately, there is one effectual remedy for the plague; it is, not to travel by the Long Island Railroad, for on no other road in this mundane sphere are tickets nipped four times in a twenty-five mile journey.

TECHNICAL.

Locomotive Building.

The Pittsburgh Locomotive Works in Pittsburgh have taken an order to build two light locomotives for the new Shouse-town, Clinton & Frankfort road.

The Boston & Albany shops in Boston have nearly completed a new heavy passenger engine for the road. A heavy freight engine is nearly finished at the Springfield shops.

Car Notes.

The Philadelphia & Reading car shops in Reading, Pa., have nearly completed two new passenger cars for the Central Division, and have recently received orders to build 15 more new passenger cars.

The Chicago & Alton shops in Bloomington, Ill., last week completed a very handsome dining car to run on the road between Chicago and Kansas City.

The Boston & Maine shops in Lawrence, Mass., have just turned out two new smoking cars for the road. The seat backs and bottoms are of split rattan.

A car-wheel foundry has been added to the shops of the Raleigh & Gaston road in Raleigh, N. C., where all car wheels needed by this road and the Raleigh & Augusta will be made hereafter.

Bridge Notes.

The Dominion Bridge Co., of Montreal, has taken contracts to build iron bridges at Welsford and Stellarton, N. S., for the Nova Scotia Government.

Iron Notes.

The St. Louis Ore & Steel Co. has been placed in the hands of a receiver. The capital stock of the company is \$5,000,000, its bonded debt \$1,000,000 and the liabilities for interest and floating debt about \$570,000. The company was a consolidation of the Vulcan Steel Co., the Pilot Knob Iron Co. and the Grand Tower Mining, Manufacturing & Transportation Co., and was largely owned in New York, Jay Gould and Commodore Garrison having been large stockholders. It is believed that the property is worth much more than the debts.

The Washburn Iron Co., of Worcester, Mass., is to be re-organized, and the Worcester Steel Co. will probably be the new name.

White Rock Furnace, near Rural Retreat, Va., which is owned by the Lobdell Car Wheel Co., has gone out of blast.

The McIlvain Iron Works, in Reading, Pa., which have been closed for repairs, have resumed work in all departments.

The large rolling mill at Danville, Pa., known as the Glendower, which failed some time ago and was seized for laborers' wages, started up again on the 8th inst. The men have been given a guarantee that back wages will be paid within six months. Work has also been resumed in the Montour Mill, but is restricted to local demands. There has been no compromise with the puddlers yet, and the company is determined not to employ them as long as they belong to the union.—*Iron Age*.

It is proposed to build a large blast furnace and steel works at Oxanna, Ala. The local ores are said to be well adapted to the making of Bessemer steel.

Manufacturing Notes.

The Taylor Manufacturing Co. at Chambersburg, Pa., recently shipped two large steel boilers to the Bibb Branch Coal & Coke Co. at Birney, Ala., and is building a large hoisting machine for the same company.

McKee & Milson, of the Lehigh Boiler Works, South Bethlehem, Pa., last week shipped, via the Lehigh Valley Railroad and the Ward Line Steamship Co., to Santiago, Cuba, two large locomotive boilers for the Jarugua Iron Co., Limited. They are making for the same company a number of immense iron chutes, which will be used in loading iron ore at the mines.

The Rail Market.

Steel Rails.—The *Iron Age* says: "There is very little of interest to report, the general position being about the same as last week. The demand for small lots is fair, but in the present unsettled condition of financial matters buyers and sellers are equally indifferent in regard to long contracts. Those who have money prefer to hold on to it, while those who require time meet with no encouragement from sellers. There is a demand for small lots, however, which, repeated from time to time, keeps the mills moderately well employed, although it is very much of a hand-to-mouth business, compared with former years. Sales at \$30@31, cash, at mill, according to quantity and delivery." A late Pittsburgh dispatch reports that a large order has been placed there at \$28.50 per ton for fall delivery.

Rail Fastenings.—The situation continues unchanged, nominal quotations being \$2.35 per 100 lbs. in Pittsburgh for spikes, \$2.50@2.75 for track-bolts and 1.7@1.8 cents per pound for splice-bars, but the market is weak and orders are taken considerably below those figures.

Old Rails.—Old iron rails are dull and weak at \$19 @ \$19.50 asked per ton at tidewater for tees, buyers offering \$1 less.

British Rail Exports.

For the month of June and the six months then ending, the exports of steel and iron rails from Great Britain to the United States and to all countries are reported as follows by the Board of Trade, in tons of 2,240 lbs.:

To United States:		June.	1882.	1883.	1884.	Six months.		1882.	1883.	1884.
Iron rails	.....	100	.....	20,567	2,399	.....	.....	.....	.....	.....
Steel rails	.....	21,223	5,281	2,004	101,234	29,856	.....	.....	.....	.....
Total	.....	21,223	5,381	2,004	121,801	32,255	.....	.....	.....	.....
To all countries:		.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron rails	.....	2,111	2,912	1,287	33,596	16,291	.....	.....	.....	.....
Steel rails	.....	69,132	78,468	57,634	357,819	391,953	.....	.....	.....	.....
Total	.....	71,243	81,380	58,921	391,415	408,244	.....	.....	.....	.....

The exports to this country in June were 63 per cent. less than last year and 90 per cent. less than in 1882; for the half-year they were 60 per cent. less than last year and 90 per cent. less than in 1882.

The exports to all countries this year for the six months have been 26 per cent. less than last year and 23 per cent. less than the year before.

Baggage Smashing—A Suggestion.

"A Sufferer" writes us on the baggage question, making a suggestion as follows: "Your item 'Scrap Heap,' July 11, meets the question only half-way. Smashing is done mainly in unloading from trucks at depots and from cars, owing to the neglect of railroad companies to supply proper mechanism for the purpose. A small, portable, quick-acting crane for loading and unloading baggage should be provided at each principal station and in each baggage car."

Preserving Timber and Ties.

The St. Louis Car Roofing Co. has received a contract from the Missouri Pacific Railway system, under which it is to furnish siding, roofing, flooring, ties, etc., treated by the zinc-gypsum process, on monthly orders, for a period of three years. The company has lately established a plant at Sulphur station, Tex., 60 miles south of Texarkana, for the treat-

ment of ties and other railroad timbers by the zinc-gypsum process.—*St. Louis Republican*.

Railroad Sanitation and Cholera.

In view of the possible entrance of Asiatic cholera into this country, the Illinois State Board of Health has addressed a circular letter to the railroad companies of the state. In this circular reference is made to a memorandum concerning the general sanitary inspection of the state already issued, and the following specific instructions are given:

"It is desired as one important step in the general sanitary movement already inaugurated, that all railway stations, depots and the ground surrounding the same be put in the best possible sanitary condition, with especial reference to water-closets and privies and to the character of the water supply for the use of employés and passengers. The same supervision should be extended also to passenger cars in the points specified. Accumulations of stagnant water or the flow and seepage of foul drainage in the vicinity of human habitations are always injurious to health, but during the cholera epidemic they are especially dangerous. So far as such conditions obtain, as the result of embankments or road-beds, they should be remedied. The preservation of the public health, whereby, among other things, interruption of travel and traffic may be prevented, is a matter in which common carriers and the general public have a community of both interests and duties, and to which it usually only needs that attention be directed in order to secure ready and efficient co-operation."

Foreign Railroad Projects.

The *Pull Mall Gazette* of July 5 says: "Two gigantic engineering schemes force themselves upon public attention this morning. One is the proposal to pierce a railway tunnel through the Pyrenees, the convention for which has just been signed by the French and Spanish International Railway Commission. The other scheme is for the formation of a company to construct an international railway connecting Europe with Persia, India, Burma and China. It appears that Sir R. M. Stephenson, who has been endeavoring to arrange with the Sublime Porte for the commencement of the works in Turkey for the last 34 years, considers that the negotiations are so far advanced as to warrant the formation of a company to work the concession, which he believes he will eventually obtain. He proposes to raise, for making the Asia Minor and Persia sections, a capital of \$80,000,000, in 600,000 shares of \$100 each, of which it is proposed \$20,000,000 shall be saved by troops' labor, leaving \$60,000,000 to be subscribed." Sir R. M. Stephenson's hopes to induce the countries through which the line passes to supply troops to make it, are, we fear, doomed to inevitable disappointment."

THE SCRAP HEAP.

A Man of Appeals.

Soon after the train left Louisville Junction the conductor came to a passenger in our coach who had no ticket. He didn't claim to have lost it, but leaned back, looked the official square in the eye and said:

"I'm dead broke and have a hundred miles to go."

"You must pay or get off," was the reply.

"Oh, certainly. I know the rules of the road by heart. I am now about to appeal to the generosity of the man in the next seat."

He appealed. He said he was an unfortunate man who had failed to strike a job in Louisville and wanted to get back home to starve to death with his family. It was a vain appeal. The man said he was in the same box himself, but was going home to kill his family instead of waiting for hunger to do the job.

"Come, you must pay," said the conductor.

"Oh, of course, but I will now appeal to the passengers en masse."

He rose up and made a little speech full of pathos, misfortune, hunger, cold and several other unpleasant ingredients, but nobody seemed interested.

"I can't fool with you any longer," remarked the conductor. "I'll stop the train and off you go."

"Hold on just a minute. I am about to appeal to you personally."

For five minutes he flung his soul into a grand effort to melt the conductor. He quoted the Bible, eulogized charity and appealed to humanity, but when he had finished the conductor reached up for the cord and said:

"I must obey the rules or lose my place."

"Say, lemme appeal once more."

"No—can't do it."

The train stopped and the man bowed good-by to everybody and got off. Nine miles up the road, where we stopped at a station, there was a rumpus outside about something and directly the man of appeals was hauled out from under the last coach, where he had been riding on the trucks. He was dirt and slush and mud from head to foot, and the conductor looked at him and said:

"Now, you want to quit this business or I'll turn you over to the first constable. You look as if a mule had dragged you twenty miles."

"Exactly, but I couldn't give it up without one more appeal."

The platforms were crowded and he flung down his hat and began his appeal. In three minutes the passengers had thrown him about \$12 in cash, and when the train moved on the conductor slipped him into the baggage-car as a dead-head.—*Detroit Free Press*.

An Insane Fireman.

The Randolph (N. Y.) *Register* says: "The engineer of the Erie train No. 1, which reached Salamanca about 11 o'clock last Tuesday night, going west, had an experience he will not care to repeat. At Cuba his fireman, a middle-aged man of huge frame, announced that he saw the devil, horns and all. The ride to Salamanca was a fearful one for the engineer, whose companion's hallucinations became wilder every mile. On reaching that station the strength of five men was hardly sufficient to conquer the crazy man and convey him to a place where he could not hurt himself or others."

A Singular Accident.

As a passenger train on the Painesville & Youngstown Railroad was at Youngstown, O., July 1, and just as it was pulling away from a water-tank, a valve in the latter broke, sending an 8-in. stream of water against the train, breaking all the windows and deluging the coaches. Many of the passengers, with their clothing thoroughly water-soaked, leaped from the train, rolling down an embankment, and some were bruised. Several ladies on the train had their dresses ruined.

The Latest Swindle.

The latest railroad swindle is a boy who submits to being put off the cars because he has no money to pay his fare. About the time the boy is on the platform a generous-hearted man comes along, hears the boy's story to the effect that he is going to see his dying mother, and the man is so moved by the pitiful situation that he declares the boy shall have his fare paid and something more. A Connecticut man

"The revenues of our road are still seriously affected by unavoidable reductions in freight rates, consequent upon the construction of new competitive lines. The receipts per ton-mile for 1883 were only 1.07 cents, being 0.08 cent lower than in 1882; and by reference to the detailed report it will be seen that there has been a continuous reduction from year to year since 1872. There has been a slight improvement in empty freight car mileage, but the percentage for 1883 still shows unfavorably, being 38.82 for the River and 44.05 for the Low Grade Division. Notwithstanding these adverse features, and the expenditure in improving the condition of your property, as above noted, the cost of operating the road was slightly reduced."



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

"WORTH REPEATING."

One of the brightest of the papers that come to our table has a column headed "Worth repeating," in which the editor places the very best of the literature (in his line) which he finds in his exchanges. The fact that the column is sometimes omitted, and is never crowded, shows that the standard of selection for it is kept high. Of course, an idea valuable in itself may or may not be worth repeating, according to the conditions under which it was first uttered. One of the first importance may gain nothing by repetition, by reason of its having already received the attentive consideration of those for whom it is written, while another of comparative insignificance may require many repetitions in order to overcome the dullness, carelessness or preoccupation of those whose attention is sought. As readers of railroad literature are proverbially busy (and so preoccupied), the title referred to commends itself as especially adapted to some of the points in the New York Railroad Commission's decisions published in last week's *Railroad Gazette*, and the fact that the points which we wish to emphasize were stated very simply and succinctly by the Commissioners sets aside any question which might arise as to the propriety of enlarging upon them or attempting to strengthen them by argument. All they need is to be kept well to the front until they become as familiar as household words. The Commissioners adduce fewer reasons for some of their decisions than we are wont to expect in such cases, and so leave some important principles apparently without sufficient support. Perhaps they assumed that the interested reader would have no trouble in recalling the facts to substantiate their theories; and with those who are unprejudiced such assumption will probably prove correct.

In the matter of the Brighton collision the Board finds that "the conductor was greatly to blame in not having insisted upon" the engineer's compliance with the rule in regard to speed. How simple a lesson, and yet how constantly disregarded! Conductors and others in places of responsibility will express their wishes, and even complain at non-compliance, but how seldom do we see the confident assurance which insists on having things done right, in the face of opposition from equals or superiors, whom it is unpleasant to have a "difficulty" with. It is comparatively easy to hold certain views, and to live up to them when we can have our own way about it, but when it comes to insisting upon their acceptance by others who must abandon their own, then weak human nature shrinks from the task of defending a mere principle;

and so we continue to have accidents which are explained by the statement that the engineer did wrong and the conductor lacked the courage or forethought to call him to account for it. The fact that engineers are in many (perhaps most) cases of a higher grade, intellectually, than conductors undoubtedly has a bearing on this question; and an inquiry as to whether conductors and engine-men are really acting as a check upon each other, as the rules contemplate, would be in order on a good many roads.

The Board says "had it (the company) been diligent to enforce its own rules, the accident would not probably have occurred. It is no excuse for the road to say it did not know. * * * It is bound * * * to know whether its engineers are sober men." We do not need to remind intelligent superintendents that this principle applies as much to other faults as to drunkenness. Indeed, if accidents were not constantly calling our attention to the facts, it would be hard to believe that this principle is so widely ignored or overlooked, and consequently is "worth repeating." Let us bear in mind, though, that it is the company on which this responsibility rests; superintendents are nothing but men, and doubtless but very few of them have too little work to do.

The Board censures the train despatcher for hiring, and the Division Superintendent for retaining, an operator who was too young. If it was possible by any reasonable effort to secure an older and better person at the stipulated price, the officers referred to were blameworthy if they did not make that effort; but if it was not possible, the fault was with the hand that held the money-bags, and the broad censure in the original report on the Chittenango collision (published June 20, page 462) holds good here: " * * * A false and excessive economy in the management forced the superintendents and employés to run trains in the face of danger, to employ young and inexperienced operators, etc. This is a far-reaching question, and it is not easy to decide the thousand different problems that come up when we consider such a question as the comparative economy of paying fifty dollars a month, instead of thirty-five, for a telegraph operator; but it is certain that in the great multitude of instances hitherto the short-sighted view has prevailed. Whether the decisions have been right or wrong, very few of them can claim to be founded upon intelligent foresight. Directors have reduced salaries simply because it seemed for the present to be profitable to do so. It is also certain that railroads will continue for a long time to come to be run chiefly for the purpose of making money; and if the public desires better operators, or more careful engineers, or more exact and comprehensive systems of management, it will probably have to devise some way of reaching these points through the pocket nerve, or at least to provide some way of getting at them without hurting that awfully sensitive organ.

The Ventilation of Passenger Cars.

In another column will be found a letter from Mr. Chas. E. Emery, complaining of the defective ventilation of the very handsome new cars of the New York, New Haven & Hartford Railroad. Mr. Emery's arguments are well worthy of attention, and it would appear that he has some cause for complaint, the construction of the ventilating appliances of the cars in question being far behind the decorations, which, however, contribute little to the comfort of the unæsthetic majority of passengers.

We have previously* called attention to the importance of providing an entrance for pure air, as well as an exit for foul air. It is evident that three conditions must be attended to in the admission of air. The current must be diffused, not concentrated: it must be warmed in winter before it reaches the passenger, and it must be free from dust and cinders. All these desirable features would appear to be attained by providing an opening with about 100 square inches area over each of the end windows next the stoves, so that the air admitted can be warmed before it is breathed by the passenger. The air should be admitted through a wire-gauze screen under the overhanging platform roof, so as to shut out dust and cinders.

These precautions are ignored on the cars in question. No wire gauze screens are provided over the openings in any part of the car, and the platform roof is so high that the smoke and cinders strike full upon the upper end windows, and their blackened condition shows that when opened they must admit a shower of dust and sparks. Ventilation from the ends is therefore unattainable, and as the clearstory windows are not protected by screens, they can only be used to exhaust the air. The pivoted sashes above

the main windows probably admit fewer cinders, but the incoming air would be apt to be exhausted at once by the clearstory windows, the current of fresh air passing completely above the passenger's head. As the main windows in most of the cars only lift three inches, the admission of fresh air is certainly hedged about by many obstructions. With a perfect system of ventilation it might be possible under ordinary circumstances to restrict the window-opening, and thus effectually prevent the occasional decapitation of passengers who crane their heads out of windows just as the train is passing a bridge under repair.

It must, however, be borne in mind that on some 30 or 30 days in the year any ordinary system of ventilation is entirely inadequate. When the thermometer stands much above 90 passengers want not only sufficient air for breathing purposes, but urgently require a strong current of air for refrigerating the overheated body. The natural temperature of the body varying in different individuals from 98° to 102°, a slight current of air only 5° or 10° cooler is insufficient to carry off the heat generated by the combustion constantly going on in the human frame, and a stronger current is needed. While the 3-in. window opening Mr. Emery complains of may possibly suffice in ordinary weather, it must be utterly insufficient when anything like comfort can only be obtained in a strong current of air, as in a car with both doors and all windows open running on a fast train round a succession of curves.

As regards the cinders which form such intimate relations with shirt fronts, it is obvious that they can only be excluded by close-mesh wire netting, or by passing the air through a spray or other form of bath. The latter remedy is expensive, and involves re-drying the air, and passengers paying ordinary fares can hardly expect to enjoy such a luxury. The wire-netting, however, is certainly absolutely required, but of course it serves only to keep out the larger cinders, which are often red-hot, and therefore sometimes dangerous. The admission under the overhanging roof is an additional and valuable precaution, as the air thus obtained is free from dust and smoke, and small cinders can hardly rise with sufficient force to penetrate a wire screen.

Chicago Shipments Eastward for the Half-Year.

The total through shipments of freight from Chicago, by the complete report, continued extraordinarily large throughout May and June, which were substantially months of the 15-cent rate; for though the rate was advanced June 24, about two-thirds of the shipments of the next week, which were nearly as large as those of previous weeks of the month, were at the old rate.

The shipments reported now include those of several junction points near Chicago that were not reported in previous years, which must be borne in mind in making comparisons. For each of the six months in the first half of the year the Chicago through shipments eastward have been, for six years:

	1879.	1880.	1881.	1882.	1883.	1884.
Jan.	192,512	163,378	263,872	321,148	272,162	213,018
Feb.	194,541	166,511	204,281	225,816	234,282	176,935
March.	258,458	318,883	312,021	179,145	308,354	244,045
3 mos.	645,511	648,772	780,234	725,109	814,798	634,016
April.	293,042	186,548	275,417	138,472	159,127	345,389
May.	280,335	125,157	171,432	115,772	149,287	349,405
June.	260,234	223,977	312,463	115,805	137,573	282,165
3 mos.	833,611	535,677	759,312	370,049	445,987	976,909
6 mos.	1,488,142	1,184,570	1,539,593	1,095,158	1,260,735	1,611,585

The contrast between the first and second quarters of this year is striking, especially when we consider that the amount of produce to be shipped and actually shipped (by all routes) was not unusually large but unusually small in the second quarter. So much the better do these figures prove the ability of the railroads to command an immense grain traffic at a 15-cent rate. This rate prevailed through the second quarter and during but ten days of the first quarter of the year.

In the first quarter the regular rate was 30 cents per 100 lbs. for grain and flour to New York, except for 10 days in January, and seven days in March, when it was 20 cents, and 10 days in March when it was 15 cents; but the regular rates were not adhered to any of the time, and the actual rates perhaps averaged about 25 cents when the regular rate was 30. The winter rates, however, were lower than in any of the other years except 1882, and possibly 1879, when also they were irregular.

Now we see that in the first quarter of the year the shipments were less than in any other year of the six, and 180,000 tons (23 per cent.) less than last year. But in the second quarter, under the 15-cent rate, the shipments were much larger than ever before, and more than twice as great as last year, when the rate was 25 cents, and 164 per cent. more than in 1882, when the rate was also 25. As we have said, the

* See Railroad Gazette, Jan. 12, 1883, page 25.

unexampled shipments this year were in spite of the fact that there was less to ship, and the increase is wholly freight diverted from the lake vessels, except that part, which is probably considerable, which was formed by the shipments of junction points, not reported till this year. We may, therefore, say pretty safely, that the Chicago railroads can always get heavy shipments from that city if they will carry to New York for \$3 a ton.

There were, however, some circumstances besides the difference in rates which tended to decrease the shipments in the first quarter and increase them in the second quarter of the year. Shortly after the 15-cent rate was made there was a great fall in the price of wheat at Chicago, which made it possible to market the large accumulations there.

The May shipments this year were the largest ever reported for a single month. Perhaps if the shipments from junction points were subtracted, they would not be quite as large as those of March, 1880, supposed to have been made at a 35-cent rate, or January, 1882, made chiefly at 10 and 12½ cents; but they certainly were very large, and very much larger than in any other month while navigation was open.

The result of these great shipments of the second quarter of the year, made at an unprofitable rate, is that the shipments of the half-year were the largest ever reported, though those of the first quarter were the smallest ever reported.

In the second quarter the shipments were so large that the gross earnings from them were doubtless the largest since 1881, but taking both quarters together, they were much less than last year. Approximately, the earnings on this traffic between Chicago and the seaboard during the half-year have been:

1879.	1880.	1881.	1882.	1883.	1884.
\$4,881,076	\$8,185,886	\$8,498,472	\$4,089,880	\$7,191,550	\$5,849,710

Thus the unprecedented traffic has yielded much less gross than in any of the other years when rates were maintained, while it is divided among more roads. It is, however, perfectly true that shipments would not have been immensely large in the second quarter of the year if the rate had not been very low. On the contrary, they would very likely have been less than in any other year except 1882. But at a higher rate there would have been some profit on the small traffic; there has probably been none at all on the large traffic.

The through shipments from New York by the trunk lines continue to be surprisingly large. They have been larger than last year every month, with the possible exception of June. The Lackawanna was out of the pool last year and its shipments were not recorded, but they did not become important until later in the year. Only one sign of the unsatisfactory condition of business is reflected in these shipments, which is that they were about a ninth less in June than in May, while last year they were as large in June as in May, and in 1882 and 1881 a little larger. Very likely statistics of the shipments of the different classes of goods would show the effect of bad trade very plainly; but so far whatever reduction there has been in the shipments of the more valuable goods seems to have been made up by an increase in the coarser freights. For the first half of this year the shipments were 15 per cent. more than those reported last year, but a large part of the difference, though certainly not the whole of it, may have been due to the non-inclusion of the Lackawanna shipments last year. Last year, however, the shipments in this first half were not only very much less than in 1882, when the railroads were carrying at such low rates that they got most of the canal and most of the coastwise shipments, but the shipments last year were also somewhat less than in 1881, and only about the same as in 1880.

Of course with two new roads carrying the freight, and allotted 22½ per cent. of it, the total needs to be a great deal larger than in previous years in order to enable the old roads to make as much out of it. The different roads seem to get on quite harmoniously with this traffic, and the rates are said to be very well maintained.

The 15 cent rate has had a very unfavorable effect on canal shipments of grain. During June the total grain and flour receipts at New York were but half a million bushels less this year than last; but the receipts by canal were 2½ millions less, while the rail receipts were 2½ millions more. The New York receipts by rail and canal in June for five years have been:

1880.	1881.	1882.	1883.	1884.
Canal.....11,350,430	6,906,110	3,177,737	6,231,910	3,476,335
Rail.....10,332,124	8,963,418	5,677,947	4,370,664	6,846,967
Total.....21,682,554	15,869,528	8,855,684	10,602,574	10,323,302

Thus the canal receipts were less this year than in any other except 1882, and were a small proportion of

the whole than in that year even (33.3 per cent., against 34.4). They were 44 per cent. less than last year, while the rail receipts were 54 per cent. greater.

Another feature of the New York grain receipts is the large amount brought by the Erie, which led, as it did last year also, in June. Of the total rail receipts 32.4 per cent. came by the New York Central, and 36 per cent. by the Erie this year, against 34.4 and 38.2 last year.

A further noticeable feature in the June receipts is the large amount brought by the West Shore, for to it we must credit doubtless all but a small part of the 858,735 bushels of increase in receipts by "miscellaneous" railroads. This is 76 per cent. more than the Lackawanna brought to New York in the same month, and more even than the receipts by the Pennsylvania. Doubtless the West Shore has been securing lake shipments of grain at Buffalo. These receipts by unspecified railroads were never before half as great. The Lackawanna seems not to have been eager for grain at the low rate, and brought little more than before navigation was open.

The Denver & Rio Grande statement for May is much better than for previous months—or is less bad. For the first three months of the year its net earnings averaged \$41,514 per month, for April they were \$104,875, for May \$146,090. This latter is \$71,369 (33 per cent.) less than the net earnings in May last year, \$128,343 (47 per cent.) less than in 1882, and \$134,526 (48 per cent.) less than in 1881, the mileage having increased largely every year. As the charges for interest and rentals average about \$210,000 per month (\$1,282,000 for the half-year) and as the net earnings for the five months ending with May were only \$375,528, the reason for failing to pay the July coupons is evident. The net earnings were not half enough to meet them. The decrease in net earnings in May is due chiefly to a falling off in gross earnings (9 per cent.); but in part also to an increase in working expenses (4½ per cent.). The reduction in gross earnings is similar to what it had been in previous months of this year, but the increase in expenses is much less, it having been no less than 23 per cent. for the four months ending with April, when of the total decrease of \$493,000 in net earnings only \$185,000 was due to smaller receipts and \$308,000 to larger expenses. The net earnings reported for the five months for four successive years have been:

	1881.	1882.	1883.	1884.
Total.....	\$348,270	\$1,015,736	\$939,721	\$375,528
Per mile.....	1,398	957	550	224

It would be interesting to know by what revolution in traffic, expenses, rates, or methods of charging, the net earnings per mile have been reduced from \$1,398 to \$224 since 1881—a reduction of 84 per cent.

The report of Union Pacific earnings and expenses for May is as follows:

	1884.	1883.	Decrease.	P.C.
Earnings.....	\$2,112,342	\$2,351,012	\$238,670	10.1
Expenses.....	1,169,867	1,223,697	53,830	4.4
Net earnings.....	\$942,475	\$1,127,315	\$184,840	16.4

The decrease in gross earnings is large and in net earnings proportionally larger, but the result nevertheless is much better than in previous months of this year, in which there had been on the average a decrease of 14 per cent. in gross, and no less than 44 per cent. in net earnings. For successive months the gross earnings have been:

	Jan.	Feb.	March.	April.	May.
1884.....	\$1,538,908	\$1,547,969	\$1,972,712	\$2,128,965	\$2,112,342
1883.....	1,916,854	1,673,224	2,391,758	2,363,377	2,351,012
Dec.....	\$377,846	\$125,255	\$410,046	\$234,312	\$238,670

May thus was substantially like April in both years, both showing a decrease of about 10 per cent. this year, against a decrease of 18 per cent. in March, 8 per cent. in February, and 20 per cent. in January.

Meanwhile the working expenses were:

	Jan.	Feb.	March.	April.	May.
Expenses: Jan.	\$233,544	\$346,950	\$738,159	\$951,940	\$942,475
1884.....	\$1,305,364	\$1,201,019	\$1,204,553	\$1,177,025	\$1,169,867
1883.....	1,019,122	1,007,454	1,095,688	1,079,243	1,223,697
Inc.....	\$286,242	\$193,565	\$108,865	\$97,782	—
Dec.....	—	—	—	—	\$53,830

Thus May is distinguished as the first month of the year in which there was a decrease in working expenses. This is not because the expenses were very small this year, for they were only \$7,200 less than in April, but because they were much larger last year in May than in previous months. For the four months previous the increase in working expenses had been half as great as the decrease in gross earnings, and so seriously reduced the net earnings.

The resulting net earnings in successive months have been:

	Jan.	Feb.	March.	April.	May.
Net earn.: Jan.	\$233,544	\$346,950	\$738,159	\$951,940	\$942,475
1884.....	\$897,732	\$665,770	\$1,266,070	\$1,284,634	\$1,127,315
1883.....	\$897,732	\$665,770	\$1,266,070	\$1,284,634	\$1,127,315
Dec.....	\$664,188	\$318,820	\$527,911	\$332,094	\$184,840

The net earnings were a trifle less in May than in

April this year, but the decrease in net earnings was much less in May than in any other month of the year. For the first three months of the year this decrease had been no less than 60 per cent., and even in April it was 26 per cent.

We may expect that there will not be hereafter those enormous decreases in the net earnings of this road which, but a short time ago, seemed likely not only to deprive it of dividends, but to leave the profits hardly enough to cover fixed charges. This is not because there are signs of a considerable increase in earnings or decrease in expenses, but because the working expenses, which were apparently abnormally small in the first half of last year, were very large afterwards, so large that it will not be surprising if there is a considerable and legitimate decrease in them for the remainder of this year; at least no larger increase is to be expected, like the average of \$196,224 per month (19 per cent.) in the first quarter of this year.

The aggregate earnings and expenses for the five months ending with May have been:

	1884.	1883.	Inc. or Dec.	P.C.
Earnings.....	\$9,300,895	\$10,606,124	—\$1,305,229	13.2
Expenses.....	6,057,828	5,425,204	+ 632,624	11.7
Net earnings.....	\$3,243,067	\$5,270,920	—\$2,027,853	38.5

The decrease in net earnings for the five months is equal to \$3.35 per share of the company's stock. Last year, however, the net earnings reported for these five months were \$642,000 (14 per cent.) more than in 1882, and larger than ever before.

June Accidents.

Our record of train accidents in June, given on another page, contains brief accounts of 20 collisions, 47 derailments and 4 other accidents, a total of 71 accidents, in which 40 persons were killed and 103 injured.

As compared with June of last year, this shows a decrease of 20 accidents, but an increase of 2 persons killed and of 8 injured.

These accidents may be classed as to their nature and causes as follows.

COLLISIONS:		
Rear.....	11	
Butting.....	8	
Crossing.....	1	
	—20	
DERAILMENTS:		
Broken rail.....	1	
Broken bridge.....	3	
Spreading of rails.....	7	
Broken wheel.....	1	
Broken axle.....	4	
Accidental obstruction.....	2	
Land-slide.....	1	
Wash-out.....	3	
Misplaced switch.....	8	
Rail removed for repairs.....	1	
Rails purposely removed.....	2	
Malicious obstruction.....	3	
Unexplained.....	12	
	—47	
OTHER ACCIDENTS:		
Potter explosions.....	2	
Broken coupling-rod.....	1	
Car burned while running.....	1	
	—4	
Total accidents to trains.....	71	

Three collisions were caused by mistakes in orders or failure to obey them; two by misplaced switches; one each by a train breaking in two, by fog and by a car blown out of a siding upon the main track.

A general classification of these accidents may be made as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road.....	11	—	—	11
Defects of equipment.....	1	4	3	8
Negligence in operating.....	17	9	—	26
Unforeseen obstructions.....	2	6	1	9
Maliciously caused.....	—	5	—	5
Unexplained.....	—	12	—	12
Total.....	20	47	4	71

Negligence in operating was thus the direct cause of 37 per cent. of all the accidents, and to this number some of the unexplained accidents should probably be added.

A division according to classes of trains and accidents is as follows:

	Collisions.	Derailments.	Other.	Total.
Accidents:				
To passenger trains.....	1	13	2	16
To a pass. and a freight.....	8	—	—	8
To freight trains.....	11	34	2	47
Total.....	20	47	4	71

This shows accidents to a total of 91 trains, of which 25, or 27½ per cent., were passenger trains, and 66, or 72½ per cent., were freight trains.

Of the total number of accidents 44 are reported as taking place during the hours of daylight and 27 at night, not an unequal division at the time when the nights are at their shortest.

The persons killed and injured were as follows:

	Killed.			Injured.		
	Em-ployés.	Others.	Total.	Em-ployés.	Others.	Total.
In collisions.....	14	3	17	18	17	35
In derailments.....	21	2	23	46	21	67
In other accidents.....	—	—	—	1	—	1
Total.....	35	5	40	65	38	103

Employés formed 88 per cent. of the killed, 63 per cent. of the injured and 70 per cent. of the total number of casualties. It may be noted that several of the killed and injured were tramps stealing a ride.

Deaths were caused by 5 collisions and 9 derailments, the

same accidents also causing a number of lesser injuries. Injuries, but not death, were caused by 6 collisions, 9 derailments and 1 other accident. In all, 14 accidents caused death and 16 injuries but not death, leaving 41, or 58 per cent. of the whole number, in which no serious injury to persons is recorded.

The month has a light record, the number of accidents being the smallest reported for a long time. The number of casualties is large, being brought up by several accidents in which a considerable number were killed and injured.

The number of collisions was small, although it includes several bad accidents. This may be accounted for by the fact that the month was generally one of light freight traffic, while the excursion season had hardly begun. The comparatively small number of new roads and of inexperienced trainmen may also account in part for this decrease.

Misplaced switches show an increase, having caused no less than 10 accidents, 8 derailments and 2 collisions, showing that this form of carelessness is still to be put down.

An unpleasant feature of the record is the large number of five malicious derailments, one of them, at least, showing careful planning and deliberate intention.

Three broken bridges are reported, concerning which it has been impossible to secure more definite information than is given.

For the year ending with June the record is as follows:

	Accidents.	Killed.	Injured.
July.....	119	57	204
August.....	144	42	136
September.....	158	44	183
October.....	174	43	234
November.....	122	34	235
December.....	112	32	113
January.....	147	56	240
February.....	110	22	150
March.....	115	26	112
April.....	88	19	168
May.....	73	32	150
June.....	71	40	103
Total.....	1,436	447	2,028
Total, same months, 1882-83.....	1,604	431	1,688
" " " " 1881-82.....	1,323	412	1,473
" " " " 1880-81.....	1,420	395	1,643

The yearly average for the four years is 1,446 accidents, 421 killed and 1,708 injured, being slightly above the total of last year in accidents, but below it in killed and injured.

The averages per month for the year were 120 accidents, 37 killed and 169 injured, or more than the totals for the month in all except the number killed.

The averages per day for June were 2.37 accidents, 1.33 killed and 3.43 injured; for the year they were 3.92 accidents, 1.22 killed and 5.54 injured.

The average casualties per accident were, for the month, 0.563 killed and 1.451 injured; for the year, 0.311 killed and 1.412 injured, or less than the average for the month, especially in the number of persons killed.

The Pennsylvania Railroad in June.

The June report of the Pennsylvania Railroad Company shows for all the lines east of Pittsburgh and Erie a decrease of \$250,697 (6 per cent.) in gross earnings, a decrease of \$154,581 (5.2 per cent.) in working expenses, and a decrease of \$96,116 (8 per cent.) in net earnings. The decrease in gross earnings is about one-half more than the average monthly decrease this year, and is seven times as great as in May, when it was trifling. The decrease in working expenses is also larger than the average, and the result is that the decrease in net earnings for the month is \$96,116, against an average of \$60,094 in the previous months of the year.

The earnings and expenses of these lines east of Pittsburgh and Erie in the month of June for twelve successive years have been:

	Gross earnings.	Expenses.	Net earnings.
1871.....	\$3,577,427	\$2,845,562	\$681,865
1872.....	3,198,989	2,150,146	1,048,843
1873.....	2,966,345	2,001,749	964,596
1874.....	2,940,192	1,959,180	981,012
1875.....	2,446,176	1,612,828	833,348
1876.....	2,380,300	1,475,867	904,433
1877.....	2,390,800	1,789,815	600,985
1878.....	3,221,477	2,209,292	1,012,185
1879.....	3,807,438	2,318,902	1,488,536
1880.....	4,093,757	2,559,431	1,534,326
1881.....	4,150,872	2,977,737	1,173,135
1882.....	3,906,175	2,823,155	1,083,019

Thus the gross earnings this year were the smallest since 1881, the working expenses were larger than in any other year except last year and 1873, and the net earnings were not only 8 per cent. less than last year, but were 30 per cent. less than in 1882 (which for most roads was a very unfavorable time), 27 per cent. less than in 1881, and only \$72,000 more than in 1880, when the stock of the company was nearly \$30,000,000 less than now.

The lines west of Pittsburgh and Erie, however, make a much more unfavorable showing for June than the eastern system. At the end of May the western lines showed a deficiency in meeting all liabilities amounting to \$363,562. During June this deficit has been increased \$360,923, to \$724,485. This is a decrease for June of \$567,544 from the result on these lines last year, when they showed a surplus, and this is nearly six times as great as the decrease in net earnings on the eastern system, and much more than the decrease in the latter for the whole six months. The decrease in the profits of the Pennsylvania Railroad Company from both systems for the month was thus \$693,660, which is as much as the usual dividend for a month.

For the half year ending with June the lines east of Pittsburgh and Erie show a decrease of \$1,019,330 (4½ per cent.) in gross earnings, a decrease of \$612,746 (3½ per cent.) in working expenses, and a decrease of \$406,584 (4½ per cent.) in net earnings—the percentages being all small, it will be seen, and the decreases less than were to be expected in

these times. For eight successive years the earnings and expenses for the half-year have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1877.....	\$14,336,306	\$9,006,977	\$4,729,329
1878.....	14,451,838	9,106,040	5,345,798
1879.....	15,414,058	9,568,203	5,845,855
1880.....	19,414,471	11,359,662	8,054,809
1881.....	21,553,839	12,556,685	8,997,154
1882.....	22,650,853	14,480,934	8,169,919
1883.....	24,352,586	15,833,962	8,518,624
1884.....	23,333,256	15,221,216	8,112,040

Thus the gross earnings for the last half-year were larger than in any year previous to last year, but so were the expenses, and the net earnings are not only 4½ per cent. less than last year, but are a trifle less than in 1882, \$885,000 (9.8 per cent.) less than in 1881, and but \$18,000 more than in 1880.

The surplus or deficit of the lines west of Pittsburgh and Erie for the half-year for six successive years has been:

Year.	Surplus.	Deficit.
1879.....	\$10,337	
1880.....	\$1,311,136	
1881.....	\$1,573,303	
1882.....	\$35,483	
1883.....		\$734,298
1884.....		\$724,490

Thus this is the first half-year since 1879 that this western system has netted a loss, and the loss is much greater than in 1879. Adding the surplus to and subtracting the deficit from the net earnings of the lines east of Pittsburgh, we have as the profits of the two systems to the Pennsylvania Railroad Company:

Year.	Profit.
1879.....	\$5,426,318
1880.....	\$9,405,545
1881.....	\$10,570,457
1882.....	\$8,225,382
1883.....	\$734,298
1884.....	\$724,490

Thus the profits this year are much the smallest since 1879; the decrease from last year is \$1,847,000, which is about 1.4 per cent. on the stock, and the decrease of 1881 is no less than \$3,183,000, which is 4 per cent. on the share capital in 1881, and 3½ per cent. on the present amount.

Through and local shipments of flour, grain and provisions eastward from Chicago for the week ending July 19, by the incomplete report to the Board of Trade, were 30,896 tons, against 24,600 tons in the corresponding week of last year, and 17,878 in 1882. For six successive weeks the number of tons shipped and the percentages of the total shipments going by each road have been:

	June 14.	June 21.	June 28.	July 5.	July 12.	July 19.
Tons:						
Flour.....	5,106	6,759	5,874	6,163	3,429	3,809
Grain.....	43,146	34,104	41,909	25,820	15,419	18,461
Provisions.....	7,925	8,172	11,564	7,781	6,625	8,616
Total.....	56,177	53,036	59,347	39,773	25,534	30,896
Per cent.:						
C. & Grand T.....	13.2	16.0	14.5	16.3	13.5	12.9
Mich. Cen.....	13.4	13.9	13.4	9.6	8.3	11.8
Lake Shore.....	15.0	11.2	12.1	12.3	19.7	19.3
Nichol Plate.....	11.3	10.5	11.1	9.1	10.9	9.6
Pt. Wayne.....	14.7	15.3	15.0	16.7	18.2	21.3
C. St. L. & P.....	7.7	10.5	9.6	11.5	7.8	5.6
Balt. & Ohio.....	13.2	12.5	7.2	10.2	10.6	8.4
Ch. & Atlantic.....	12.1	11.2	16.2	14.3	11.0	10.8
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

The total shipments last week, it appears, were a fifth larger than the week before, which may be due to the advance in rates at the beginning of this week. The shipments were larger than usual at this season; but the rates also were lower than usual. This week, for the first time this year, they are on a level with the rates of the last two summers, but probably a much larger part of the shipments this week will be at last week's rates. At least the course of the shipments heretofore, when rates have been advanced, has been such as to indicate that it is about ten days after an advance of rates before all the freight going eastward from or through Chicago takes the advanced rate. Thus the advance from 15 to 20 cents went into effect June 24; but the shipments for the week ending June 28, during two-thirds of which the 20 cent rate was in force, were larger in that week than in any previous week since April. In that case the shipments were undoubtedly exceptionally large on the first days of the week, which were the last of the 15-cent rate, and this was true also at points west of Chicago, so that it is easy to understand why much the larger part of the shipments in that week should have been at the old rate. But in the week ending July 5 the shipments should, we might suppose, have been less than the average under the rate, because of the recent large shipments, and also because of the holiday in that week. That is, if anticipation of the advance in rates had caused freight to be forwarded before it would have been otherwise, this must have left less to go forward immediately afterward; but in fact the shipments of the week to July 5 were one-half more than in the following week, and 30 per cent. more than last week, which leads to the conclusion that no inconsiderable part of the eastward shipments passing through Chicago during the week ending July 5 were carried at the 15-cent rate, which was superseded June 24. In the light of this experience it will not be surprising if the shipments during this week should be about as large as last week, in spite of the advance in rates last Monday.

The increase in shipments last week over the previous week was general—11 per cent. in flour, 19 per cent. in grain, and 30 per cent. in provisions.

The distribution among the several railroads was much more unequal last week, when we may assume that all was carried at 20 cents, than for many weeks previous, the Fort Wayne and the Lake Shore having a long lead over the other roads, while the Chicago, St. Louis & Pittsburgh and the Baltimore & Ohio fall below their recent proportions. The three Vanderbilt roads together carried 40.9 per cent. of the whole, the two Pennsylvania roads 27 per cent.

The Chicago shipments are usually lighter in July than in any other month, but they often increase considerably early in August, though sometimes they are very light until about the end of that month, depending largely on the supply and demand for grain. This year the stocks of old grain have been reduced quite low, and the winter wheat harvest has

not been early, and in but a small part of the country tributary to Chicago has it been good. Further, the demand is by no means pressing, and the prices are such that there is no advantage in hurrying forward grain, as there sometimes is when the price is materially higher for July or August delivery than for September or later delivery. The spring wheat, which is the plentiful one this year, and is marketed chiefly at Chicago and Milwaukee, will hardly begin to come forward, except from Nebraska, until September, and there is but a scant supply of last year's poor crop of corn left in farmers' hands, though the good promise of the present crop will doubtless lead them to market what they have much more freely than for three summers past, which may make a great difference in the movement. At present, however, corn brings as much for October as for present delivery. An early movement in wheat is felt south of Chicago sooner than at Chicago, but there is no sign of any yet.

If we were to judge of the condition of the Northwestern lumber trade by the consumption, we should have to conclude that it is in an exceptionally flourishing condition. There is complaint at Chicago of unusually successful competition by the mills on the Mississippi and in western Wisconsin, yet the Chicago sales have been larger this year than last, but 5 per cent. less than in 1882, when they were largest, and very much greater than in any previous year. For the last four years they have been for the six months ending with June, in thousands of feet:

Year.	1881.	1882.	1883.	1884.
	545,944	862,388	767,436	818,325

Actually, however, there has been a great fall in prices, and the manufacturers are so well satisfied that the supply will be greatly in excess of the demand, that there is much talk of making a grand combination to close the mills in the middle of September, two months earlier than usual, which would be more than a fourth of the sawing year. The trouble is that this year's cut has been going off slowly and only at reduced prices. The stock on hand at the beginning of this year was equal to 77½ per cent. of the half-year's consumption. Lumber, especially at this season, is bought largely for consumption some time in the future, and though the spring building, which is largely the completion of plans made the year or winter before, with capital then provided, has required a very large amount of lumber, as we have seen, evidently the retailers in the interior know that less work of the kind is contemplated for the remainder of the year, for the prices have gone down without any great increase in the supply, or accumulation of stocks, which latter, however, was 9½ per cent. more this year than last, and larger than ever before at the middle of the year. Lumber bills for new structures are likely to be presented to the dealers almost as soon as the building is decided upon, and with few inquiries they know that sales must be light in future months, however much lumber may be going out of their yards at the time.

British rail exports to this country in June last were only 2,004 tons, but even this small amount is 40 times the May exports, and above the average this year, though the whole amount is so insignificant that the change has no importance. For the six months ending with June the British rail exports to the United States for six successive years have been:

Year.	1879.	1880.	1881.	1882.	1883.	1884.
	7,730	125,578	157,824	121,801	32,255	10,701

For three or four years previous to 1879 our imports had been almost nothing. We see that in 1880 they were 16 times and in 1881 more than 20 times as great as in 1879, but that since 1881 there has been an uninterrupted decrease, so that this year they were not 7 per cent. of what they were in 1881, and but one-third of what they were last year even.

It is noticeable that this country has ceased entirely to import iron rails. The amounts of these imported in six months to June 30, for six years, has been:

Year.	1879.	1880.	1881.	1882.	1883.	1884.
	301	62,671	65,088	20,567	2,399	....

The United States became the chief market for iron rails after 1879, when the demand for rails was so great that it could not be supplied; but this has not been true since 1882. Very few iron rails are taken in any country now, and they have formed but 2.4 per cent. of the total British rail exports this year, against 4 per cent. last year and 8½ per cent. in 1882.

In the first months of this year the British rail exports to countries other than the United States were as large as they had been for many years, but there has been a great falling off since, and for the six months they have been 290,439 tons this year, against 375,939 last year and 269,614 in 1882—leaving them still larger than in 1882, it is seen.

The countries taking the most rails this year are Australasia and India, this country standing seventh on the list, where it used to take vastly more than any other country.

The following are the takings of the several countries that have received more than 20,000 tons in the half-year:

	1882.	1883.	1884.
Sweden and Norway.....	7,114	9,626	21,632
Italy.....	32,651	36,167	3,534
United States.....	121,801	32,255	10,701
Mexico.....	13,692	15,681	2,370
Brazil.....	23,023	16,632	22,012
Argentine Republic.....	17,390	46,610	27,584
Canada.....	3,440	30,189	20,447
South Africa.....	7,889	22,292	7,889
East India.....	56,755	84,845	52,167
Australasia.....	36,550	62,640	58,693

Even the countries which have taken most this year took less than last.

The general reduction of construction work throughout the world is indicated by the course of iron and steel exports from Great Britain better perhaps than by any other

one thing. These exports have been, in tons of 2,240 lb., for the half-year ending with June:

1882.	1883.	1884.
2,094,839	1,972,379	1,771,171

Thus the exports this year were 10 per cent. less than last year, and 15½ per cent. less than in 1882. The decrease in the value of the exports is not so great as would be expected from the great fall of prices in this country, the average reported value per ton exported being this year but 4 per cent less than last year, though in pig iron the reduction is 11 per cent. and in steel rails 10 per cent.

In reference to the Hart safety foot-guard for frogs and guard-rails which we illustrated in our issue of May 9, we should have said that it is not necessary to drill the rail in order to fasten in the wooden blocks under the head of the rail, as would appear from the engravings and descriptions which we gave. If drilling the rail be objected to, another plan is used, which is to drive a spike in the tie and knock it over into a small recess which is cut in the block, so as to give flush surface and yet firmly hold the block in place. This method, the inventor says, is proving very satisfactory and is now generally preferred.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Chicago, Burlington & Quincy.—The *Kennesaw Cut-off* is completed by an extension from Holdrege, Neb., southwest to Oxford, 21 miles.

Fargo Southern.—This new line is 2 miles longer than heretofore reported.

Illinois Central.—The *Canton, Aberdeen & Nashville Branch* of this company's *Southern Division* is extended from West Point, Miss., northeast to Aberdeen, 15 miles.

Louisville, New Orleans & Texas.—Extended from Stoneboro, Miss., north to Porter Bayou, 16 miles, and also from Clarksdale, Miss., south 5 miles.

Vicksburg, Shreveport & Pacific.—Extended westward to Shreveport, La., 6 miles, completing the road.

This is a total of 65 miles of new railroad, making 1,584 miles reported to date for the current year. The total track reported laid to the corresponding date for 13 years past is as follows:

Miles.	Miles.	Miles.
1884.....1,584	1877.....751	
1883.....2,658	1876.....1,010	
1882.....5,304	1875.....538	
1881.....2,615	1874.....839	
1880.....2,427	1873.....1,872	
1879.....1,122	1872.....3,237	
1878.....900		

These statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

NEW PUBLICATIONS.

The Modern High Explosives. By Manuel Eissler, M. E. New York. John Wiley & Sons:

It can hardly be but that this work will be highly useful to all those who have to do with nitro-glycerine and its compounds and allied explosives, either as manufacturers or as consumers. The part devoted to the mere process of manufacture is perhaps unduly large for the requirements of a majority of its purchasers, but mixed in with it is a great amount of data as to its nature and handling which will be both interesting and necessary—at least it ought to be considered so—even to the mere consumer.

The first part, of 155 pages, is devoted to processes of manufacture and chemical formulae. The second part, of 70 pages, to directions for the use of high explosives and various methods of igniting. The third part, of 140 pages, to the principles of blasting, in large and small blasts, and for various purposes, including the blasting of ice, piles, stumps, sunken vessels and masonry, as well as blasting proper as ordinarily understood. Thirty pages are given to "big blasts," fuller information being given on this most important subject than can elsewhere be found collected together; and perhaps this is the part of the book, comparatively small as it is, which will best repay the study of engineers and contractors, as this method of executing heavy rockwork, especially on steep slopes, is too much neglected, doubtless from the fact that no one man is likely to have experience in many successive situations which admit of using explosives in this way. That they can be and are used, however, not only for moving rock but also earth with immense economy in situations which admit of it (and there are far more such than is always realized) is beyond a doubt; and therefore, as we say, the data on this subject here given should have careful study.

It almost seems as if undue liberties had been taken in quoting from Mr. Drinker's splendid treatise on tunnelling. Two whole chapters is a good deal to quote bodily. But this in no way diminishes the value of the book—rather the contrary; and for every one interested in the subject it is a book to own.

Notes at Altoona.

The system of "piece work" which was introduced about seven years ago in a few of the shops, was found to result to the mutual advantage of both the company and its employes and has been generally adopted. New locomotives are erected, old locomotives are taken down for repairs, new passenger and freight cars are built and painted at so much apiece. A general idea of the workings of this plan may be gathered from a visit to the car shops. Twelve men work in a gang in the erection and completion of the outside of a passenger car; two men work on each end, four men on each side. They select one man as their foreman, who is held responsible for the work. They divide the receipts

equally, and in case a man fails to "keep up his end," the sub-foreman reports him to the general foreman, who takes such measures as he sees fit. Twelve men generally complete the outside car work in six days, although some gangs have done it in five days. The earnings of the men per month are now higher than under the "old system."

The "Test Department," which was organized in a very humble manner in 1877, has grown to be a most important factor in the purchase of materials and supplies. Samples of most of the materials offered the Purchasing Agent are tested before the contract is awarded, and other samples from the goods delivered are tested before the bills are paid. As an example, manufacturers of boiler plate steel are required to furnish a sample from each plate cut through the "brand," so that it can be identified by matching the detached parts. Each sample is tested, and the plates which do not come up to the specified standard are returned to the manufacturer.

The machine for testing tensile strength consists of a steam hydraulic apparatus. Three eccentrics on the same shaft drive three pump-rods in succession, their stroke being regulated by a wheel gearing into a contrivance similar in its working to the locomotive link. In this way the desired power and speed may be produced. Wire, chain, bolts, bar-iron and various other supplies are tested here daily. A diagram of each article that is put through the torsion test by another apparatus is carefully preserved.

The machine for testing lubricating oils is of ingenious construction. A journal is made to revolve in a bearing at the same rate as when a car wheel moves—15, 30 and 60 miles an hour. The amount of heat produced by the friction is accurately shown by a thermometer, while a pendulum moving upon a graduated arc shows the amount of friction or resistance, the wearing quality of the lubricant being determined by the length of time it will stand the test. About one pound of phosphor-bronze bearings is worn away under a car for every 25,000 miles run (or two ounces for each bearing), the journals being supplied with the standard lubricant. The testing of the oils alone has resulted to the great pecuniary advantage of the company; and the honest manufacturer has shared the benefit with the company, since he is now able to sell good material to a better pecuniary advantage than when brought into competition with adulterated goods. Some idea of the accuracy of the tests may be gathered from the fact that a non-believer in the system who was requested to adulterate some materials and make a memorandum of the proportions used was afterwards handed a test report which coincided almost identically with his figures. He immediately became a convert to the system.

For some years the Pennsylvania Railroad Company experimented with a view to determine the proper chemical formula for the iron for cast-iron car wheels. Old car wheels, new iron and old steel rails are melted together in certain proportions with very beneficial results. This is poured into a mold, so that the tread and not the flange comes into contact with the iron chill. These wheels are afterward annealed and allowed to cool gradually, three days being thus consumed. The superiority of these wheels was shown at a recent test, when 87 well-delivered blows were directed on the same spot on the side of the wheel with sledges weighing about 20 lbs. before the iron yielded, the chilled iron in the tread not even being cracked. Of 80,000 wheels made in 1883 only two wheels were broken in service.

Revolving emery wheels are used to take out the "flats" in the tread of car wheels, the periphery of both wheels being similarly reduced at the same time without taking them off the axle. A portable drill for boring, reaming and countersinking the bolt holes in the pedestal jaws of a locomotive frame shows great ingenuity on the part of the inventor. Molding machines are used in the casting of car axle boxes and brake shoes, and save much labor and add to the capacity of the works.

The powerful erecting shop traveling cranes are worked by flying rope and effect a great saving of time, as a locomotive may be lifted from the ground and her wheels removed in three hours. A new locomotive has been put together, tested and run out of the shops in 20 hours after the various parts were on the ground.

All the smaller tools used in the shops are manufactured in the tool-room. There is also a department for the manufacture of electric supplies, telegraph instruments, relays, zincs, bells, etc.

The serious results which would follow a general conflagration at the shops have led the company to create a systematic organization for fire purposes among the employes, who are drilled from time to time and sometimes called out by false alarms, so that the officers in charge may inspect their workings. A copious supply of water from Brush Mountain can be used to good advantage by the fire brigade.

A short section of the old Portage track, with stone sills, wooden cross ties at the joints, 42 lbs. iron "T" rails without base, supported by chairs, is preserved in the shop yard.

Organization for the Collection of Revenue.

[From Marshall M. Kirkman's forthcoming book on "The Theory and Practice of Collecting Railway Revenue without Loss."]

Where defalcations are of common occurrence the losses they entail are trifling compared to the hidden losses they indicate that are never known or suspected. The visible defalcation is the outward demonstration, the tumor or excrescence that denotes the rottenness within; the constitutional malady that afflicts the patient and that foretells his dissolution. The remedy does not lie in the application of

poultices or unctuous ointments, or in the exacting of guarantees, but is to be found in the reorganization and perfection of the system thus afflicted, in the placing of it upon a higher and better basis. It lies in the enforcement of just and salutary principles of business: in decentralization; in maintaining the self-respect of employes; in retaining their confidence; in the absence of favoritism; in the exercise of greater care in the selection of men; in the frank and uniform recognition of employes; in permanency of service; in retention and reward as the result of faithfulness and capacity; in avoiding the terror excited among all classes of subordinate officials and employes by arbitrary changes and other evidences of personal power; in making fitness and priority of service the basis of advancement, and finally, in placing a higher estimate upon common honesty, manliness, talent, acquaintance with the business and loyalty to its interests. Those who manage for themselves intelligently observe these requirements, and herein lies the secret of their success. A like success attends the supervision of others when the principle here laid down is faithfully observed. The mere agent, however, too often loses sight of the interest of the principal in his own personal ends and ambitions. He becomes arbitrary, unjust and tyrannical. These qualities grow with their exercise, and with the lapse of time he becomes a monument of selfishness, egotistical assumption and perverted purposes. His likes and dislikes become the evidence of worth, the test of fitness. He can no longer understand how any one personally offensive to him may still be worthy. The failure to win his regard is fatal. To those who attain this felicity many little crumbs and tidbits are thrown, which may be partaken of with tolerable security if not with self-respect. Such is the representative tyrant. He instinctively fears the talented, and manliness excites his apprehension and anger. His object being to make all things subservient to his ambition, his course abounds in specious pretexts and illusive promises. Adroit and unstable, he is consistent only in his enmities and persistent only in his purposes to have around him mediocre men whose aims and ambitions will ever be subservient to his own. This is the man who destroys the ability, manliness, loyalty, integrity and high purpose inherent in large bodies of educated men. Under his manipulations they become mean in their objects, mean in their ambitions, mean in their methods and mean in their attainments. The selfishness, the short-sightedness, the weakness, the method and the aim of those permitted to exercise arbitrary power is the same everywhere and under all conditions. It is the same in the business manager, political boss, emperor or khan. The simple act of exercising irresponsible power destroys the equilibrium that exists between the intellectual and the physical man; reason succumbs to passion and logic gives way to force. Man no longer strives to attain perfection; he is intent solely upon the gratification of his desires. To him there is no attainment in life superior to the exercise of his personal wishes and the gratification of his passions as they are evinced in his likes and dislikes.

No corporation, private or public, can ever expect to obtain the full fruition of its purpose, or long retain a healthful vigor, that leaves the disposition of its offices to the caprices of its authoritative agents. When so organized or conducted it carries within it the evidences of its own destruction, and we need not await the final consummation of the event to foretell the fact. If we would expect the subordinate (who is the soul of the organization) to regard the interests of the proprietor rather than those of his agent, we must deprive the latter of the power to punish unjustly, of the power to use the office to accomplish personal ends, to reward personal service or to gratify personal preferences or hatreds. So long as the agent is more powerful than the principal, so long will the interests of the agent rather than those of the principal receive consideration. In other words, men will, under such a condition of affairs, regard positive advantages to themselves rather than what they will agree to consider purely speculative objects. Wherever the agent is allowed discretionary authority in the exercise of functions that properly belong only to the master, he will in every case end by usurping the latter's prerogatives. If the master fail to protect those who serve him, the quality of the service he receives will depend entirely upon the disposition of the person able to offer this protection. If this person is disinterested, amiable, honest, experienced, loyal, vigorous in body and mind, free from private ambition, just, zealous, not envious or jealous, commanding in talent and able withal to comprehend ubiquity, the service (of which he is, under such circumstances, the brain, heart and viscera) will be efficiently and honestly conducted; otherwise not. These qualities can never exist in a single individual; it follows, therefore, that the conditions that presuppose them are mistaken and must result disastrously to those who intrust their interests to a system so inherently grotesque, false and vicious.

The measure of intelligence, zeal and faithfulness observed by employes, whether in the service of great corporations or governments, will, as a rule, depend directly upon the care exercised by the employer in protecting and fostering his interests. If he fails to exercise this care, this intelligent and practical forethought, his interests, he may be certain, will be subordinated to the objects and ambitions of others; affairs will be managed so as to aggrandize the servant rather than the master. The latter will be awarded only such regard as public decency or a vicarious conscience compels, while the interests of the servant will receive the maximum benefits that opportunity offers or that is consistent with retention of office.

In the operation of railroads the objective point of endeavor is the revenue that accrues from the business trans-

acted. It is for this that the proprietors contribute money for the construction of railroads; it is for this that they are operated; it is to protect this that responsible men are appointed to fill offices of trust; it is for this that intelligent safeguards are thrown around its business and that forms of accounting are introduced and perfected. So that, if by any means the revenue of a company is frittered away or lost, the object for which it is operated (from the proprietors' point of view) is not attained. The community suffer, moreover, in the event of loss, for the reason that through their patronage they furnish the money required to operate railroads and to pay interest on the invested plant, and if loss occurs the deficiency must be made good in part or wholly by them. Every reasonable and proper device, therefore, that can be thrown around the revenues of a railroad inures to the benefit of the public as well as the proprietors.

Under the ordinary circumstances attending the affairs of business, each participant therein depends upon his own experience and observations for protecting himself and for advancing his interests. Except in a limited and exceedingly practical way he has not the facilities, if the desire, to derive benefit from the experience of others. In the counting-room or factory he makes use of processes that he has observed or that his talent for business suggests. He makes no permanent record of his conclusions and practices, and when he dies only an imperfect and temporary record is left of his methods of doing business. His successor takes up the thread, not where he left it, but where he began, and thus the experience of business is acquired and lost, and the never ending treadmill repeats itself with dull monotony from generation to generation.

The successful merchant or manufacturer exemplifies in himself the truth and the justice of the survival of the fittest. He pursues his avocation with greater zeal, intelligence and determination than his fellows, and in so doing reaps the margin of profit that they fail to gain. He works with his own capital, or with credit, which is the same as capital. The methods that he employs are largely original with him, and however crude or ill adapted they may be, it concerns only himself. It is different with everything that pertains to the operation of railroads. While the money used in their construction belongs to individuals and is contributed for private ends, the general purposes that the property serves are now considered of a semi-public character. No interest is more closely allied with the public welfare than our railroad interest, and everything that concerns it affects the community. The railways are the grand arteries through which the tide of commerce ebbs and flows, and nothing can clog these channels without embarrassment to the community and increase in the cost of doing business. Moreover, the revenue of our railroads is so great, its ramifications extend into so many different channels, it is governed by so many peculiar and exceptional conditions, and it is dependent on the fidelity, experience and zeal of so many hired agents, that any one who can suggest more economical, simple or effective methods for collecting and handling these vast sums of semi-public money, or for managing the property from which they emanate, is performing a semi-public duty as well as a service to the owners of the property. Every one connected with the operation of railroads is, therefore, morally and logically bound to use the most effective methods attainable in the conduct of the business entrusted to him. If his appliances are the best, or if he thinks them the best, well and good; let him use them and let him make them public. It is in this way that all knowledge has been acquired and retained, and it will never be acquired or retained in any other way. The mind that conceives itself belittled in disseminating such knowledge, or in discussing questions of this character, is essentially "base, common and popular." In consequence of the semi-public character that attaches to railroads, the time will come when all the mechanical affairs pertaining to their operation will receive, and properly too, the constant and intelligent surveillance of the public, not in the general and restricted sense that it now does, but in every department of the service. In the exercise of this surveillance the proprietor will derive relatively greater benefit than the public. Railroad officials will then be held to even greater accountability for the intelligent and faithful discharge of their trusts than governmental servants, and for the reason that to the feeling of self interest and curiosity that attaches to the acts of the public servant will be added the inborn and prying jealousy felt by the community for all corporate interests. This publicity, among other things, will have this useful purpose: It will serve to familiarize the officers of the various companies with the methods and appliances of each, so that in the course of time there will be evolved from the discussion and experiment that will follow one complete harmonious whole, not the creation of one intelligence, but of the aggregate intelligence of all.*

The collection of railway revenue, from being a very uncertain and hazardous process, has, under the approved methods now in vogue, and known to many financial officers of railroads, become comparatively simple, definite and stable. It is no longer necessary to calculate that a certain percentage of the revenue will be lost in collection. The shortages that were at one time so frequent in the history of railroads were the direct and inevitable result of poor appointments and lax administration. Defalcations may be

expected to occur wherever unfit appointments are made or where the methods of collecting are not carefully instituted and rigidly enforced. This statement is not made idly or ill-advisedly. I have observed the operation of collecting railroad revenue under almost every conceivable circumstance and method, and while the process is exceedingly difficult and attended by constant disaster under unfavorable circumstances, it is comparatively easy and free from mishaps under favorable circumstances.

THEORY.—I may be pardoned for giving a practical illustration of this here. Many years ago a great corporation with which I was connected as the principal accounting officer had suffered from many defalcations. These mishaps finally culminated, at the time referred to, in the simultaneous defalcation of several agents, whose delinquencies amounted in the aggregate to some \$40,000. The financial agent of the company sent for me, and after expressing his annoyance and apprehension at the extent of these losses, asked who was immediately responsible for the collection of the company's earnings. I replied that no one man was responsible; that the local treasurer, the accounting officers, the general traffic agents, and practically the managers, exercised a joint supervision over the accounts of the agents; and that the superintendents, who were responsible for the physical operations of the road, and who appointed and dismissed all agents, reserved the right in all cases (as they did on other roads) to exercise their discretion, no matter what the circumstances might be, in reference to the dismissal of an agent who was inefficient or derelict in his duties.*

The responsibility therefore rested upon many different officers, each of whom was personally zealous and intelligent in the exercise of his duty, but that each and all were hampered in their action by many conflicting considerations, not the least of which was a proper and necessary delicacy about interfering with the real or supposed duties of others. That, in fact, innumerable instances were continually occurring in connection with the accounts of a railroad company operated in this manner, where the various officers were in doubt as to their duties and responsibilities, and hence acted hesitatingly or not at all.

PRACTICE.—He listened to this explanation, and closed the interview by directing that I should thereafter have sole charge of the company's accounts and the collection of its earnings; that all agents should conform absolutely to any regulations that I might see fit to make governing the revenue and accounts; and in the event an agent was found derelict or indifferent in the discharge of his duties, no matter what the circumstances might be, that he should be removed. With this understanding, and upon these conditions, I told him that I thought it would be possible to greatly lessen, if not entirely prevent, the recurrence of the shortages that had so much alarmed him. Under the arrangement thus entered into I collected over three hundred millions of dollars without the loss of a dollar to the company through the dishonesty of any of its agents. Something of this freedom from loss was attributable to the effective methods used in collecting and handling the money, but still more of it was attributable to the integrity of the agents. This integrity was carefully and intelligently fostered, as every virtue should be, and those who exercised it knew that its practice was observed and heartily appreciated.

It is thus apparent that it is possible, under certain circumstances, to collect the vast revenues of a railroad without the loss of a dollar to the proprietors. It is generally believed by those who have not been able to give the subject careful consideration, that it is unavoidable that every great corporation should lose a considerable sum each year from unfaithful agents. This belief is not surprising, in view of the great number of comparatively untried men who have charge of the collecting and handling of the funds of railroads; and it is possible in the case of many companies that they cannot escape loss from this source; but, in the majority of instances, if proper authority is delegated to the collecting officer, and he possesses sufficient courage and force and has the hearty co-operation of the executive officers in the exercise of his difficult task, defalcations, instead of being looked upon as unavoidable, will cease to occur, or occur only at rare intervals.

The efficient collection of railway revenue involves an impersonal organization of the force employed at stations. Only capable and above all faithful men should be appointed to such places. No method or trick of accounting, no collecting officer, no corps of assistants and inspectors, no matter how capable, can prevent losses, unless fitness is made the test for appointment and retention in the responsible office of station agent. One unfaithful agent will require the undivided, constant, personal surveillance of an alert and intelligent inspector to protect the company absolutely from danger of loss. This is the expense that a company must expect to pay for the employment of unfit men if it wishes to escape the physical loss—the absolute theft of the money passing through their hands.

To sum up, we may say that it is essential to the efficient collection of railway revenue that unfaithful agents shall not be appointed; or if they creep into the service, that they shall be promptly removed; that the utmost intelligence shall characterize the organization of the accounts; that the

utmost watchfulness and energy shall at all times be exercised to see that the provisions of the accounts are faithfully carried out, and finally that the supervision of this complex machinery shall be intrusted to a capable and resolute officer.

Where defalcations are of frequent and aggravated occurrence, the actual known amount involved, as already remarked, forms only a part, and a very small part, of the losses that a company is suffering from unfaithful servants. The peculiar nature of much of a railroad company's business and the extended territory over which it is scattered, and the opportunities it offers unfaithful men, will, we may be certain, be taken advantage of wherever the service has become demoralized either through imperfect organization or lax administration. If we would feel reasonably assured that a company is receiving the full fruition of its enterprise, the *esprit de corps* of the service must be maintained at the highest point. Freedom from loss is to be sought in preventing irregularities, not in recovering ascertainable losses through the agents who are unfaithful or through those who guarantee them. Where the service of a company has been allowed to become demoralized, the protection afforded it by the security offered by bondsmen and guarantee companies is only partial at best. They may make good the known deficiencies, but the subtle hidden losses that sap the resources and destroy the vitality of an organization thus affected they do not pretend to make good, and could not if the amount were determinable. The security offered by bondsmen and guarantee companies is necessary and valuable in its way as an auxiliary support, but if a company expects to escape losses it must supplement the protection afforded from these sources by a careful selection of its agents, a thoughtful regard for their interests, and a wise, constant, and firm supervision over all their official acts. The agent must be taught to take pride in his personal integrity and must be educated to believe that want of honesty and loyalty toward the company employing him is especially deplorable.

The collecting officer of a railroad is largely dependent upon his assistants, and in their selection and government he will display the measure of his fitness. Having instituted his method of accounting with such wisdom and experience as he has, its reasonable efficiency will be dependent greatly upon the supervision he is able to exercise over its operations through his subordinates. Having explained to the station agent how the company's money should be handled and accounted for, he must look to that agent for studious compliance with his wishes. But as there will be continual cases arising where the agent will not understand clearly what is required of him, or will neglect the same, it is necessary that the collecting officer should have skillful and trustworthy assistants, acting under his immediate instructions, whose duty it is to make careful and frequent examinations of the accounts at the various stations. The title quite generally bestowed upon this official is that of traveling auditor. This experienced and valuable official is the eye of the collecting officer and the medium through which he makes his wishes known, and as already stated, the thoroughness and intelligence with which the traveling auditor performs his work will indicate the capacity of his superior. It is the duty of the traveling auditor to visit every station, interrogate the agent, see that his books are fully and properly written up, count his cash and carefully balance the same, noting any discrepancy that may occur, and carefully investigate the cause thereof. In these examinations that occur at infrequent intervals, according to the circumstances of the case, any errors or misapprehensions that the agent may be laboring under are carefully corrected, and so systematic are the inspections, when rightly conducted, that an agent must be exceedingly dull or indifferent if he does not rapidly acquire the facility of an expert in the conduct of his office. The duties of a traveling auditor require great clearness of mind and perfect familiarity with traffic accounts of railroads, and as he is frequently called upon to act in cases of emergency, where it is impossible for him to consult with his superior, it is necessary he should be a man of resolution and resources. He must, moreover, be able to command the respect of those with whom he comes in contact, and so far as possible secure the hearty acquiescence of all in the instructions he finds it necessary to give. Much of the work he is called upon to perform cannot be classified or consecutively explained, but there are many things in connection with his duties that may be anticipated and provided for. That is one of the purposes of this book.*

Its object is to explain, as far as possible, the theory and practice underlying the efficient collection of corporate earnings; to describe the duties of employés in connection with the collection, custody and transmission to the proper officer of such earnings; to explain in advance what action should be taken in cases of emergency, and to systematize the methods of procedure so that the instructions governing the force will be the same in all cases. This last is especially important, for the reason that officials are constantly being changed, and if definite written directions are not provided, more or less diversity will characterize their instructions. This confusion, while it may not be fatal to the efficiency of the service, will nevertheless retard its growth and greatly weaken its usefulness. If proper discipline is to be observed, it is of the greatest importance, in the operation of railroads, that the orders given at particular times and covering specific things should afterward be reiterated under similar

*It is this belief partly that has prompted me to write and publish the numerous books on railway subjects with which my name has been connected. Herein I have found the incentive. They are not personal to me, and in all things have been intended to and do, I believe, represent the general and best good of the railroad companies so far as they go, and in so far as they represent the best good of the railroad companies they also represent the best interests of the public.

M. M. K.

*There is an impression more or less general upon railroads, that where, for any reason, it is not considered desirable to discharge an unfaithful employé, the collecting officer may be relieved of all responsibility in the matter. This is, I think, only qualifiedly true. The collecting officer may, of course, be relieved of responsibility, but there is no one short of the general management that can grant such immunity, or in other words, can relieve an employé from the observance of just and necessary rules and regulations. Certainly no subordinate officer has this right or privilege, and its exercise cannot result otherwise than in encouraging irregularities.

M. M. K.

*The rules and regulations that this book contains are not new or untried, it is proper to remark, but are such in many respects as I have made practical use of for a quarter of a century.

M. M. K.

circumstances in exactly the same terms, no matter what time may have elapsed or how many changes of officials may have intervened meanwhile. This definiteness is possible only under a written code. Where corporations are governed by traditions and verbal understandings, demoralization more or less marked is unavoidable, and conflict of authority, instead of being the exception, will be a matter of common occurrence.

TECHNICAL.

A New Automatic Freight-Car Brake.

The following is from the *Cleveland Herald*: "Yesterday there was exhibited at the yards of the Lake Shore in this city a new automatic freight-car brake, the invention of L. S. Colburn, of Oberlin, O. The apparatus is very simple, and has been applied to car D 3,788 of the Lake Shore Red Line. It consists of a U-shaped iron frame or yoke, which is hinged to the cross-beam of the car, carrying a friction wheel provided with suitable axle, to which the brake-chain is attached. This wheel is suspended over the axle by means of a chain attached to the front end of the iron frame and also connected above to the arm of a rock shaft, which extends to the side of the car and there connects with an upright lever reaching about 1 ft. above the top of the car. This lever is held in a perpendicular position by a spring-catch, which is operated by a double-acting lever or trip reaching to the centre of the car deck. When it is desired to set the brakes on one or several cars, as in the ordinary handling of a train, the brakeman has only to move the trip either backward or forward with his foot (which can be done on the run). This allows the friction wheel to drop upon the revolving car axle, which immediately winds up the brake-chain, but to more thoroughly provide against accidents, such as broken couplings, approaching trains, etc., etc., the tripping device is provided for the reception of a small cord or rope, whereby the whole train can be connected either with the cab or caboose, or both, and by a sudden pull upon this cord every brake upon the train can be set instantaneously. In case of a broken coupling the brakes would all be set automatically and both ends of the train brought to a stop before any damage could be done."

Coal and Iron in Alabama.

The Watts Coal, Coke & Iron Co., of Warrior, Ala., has begun work on the branch line of railroad leading from the Louisville & Nashville road, near Warrior, to the mines, distance about 1½ miles. The grading will be rather light in comparison with some other lines in this neighborhood. The company has at present opened four or five drifts on the vein, which it proposes working. It is from 2½ to 3 ft. thick, and in quality and position superior to any other coal known in the Warrior field. Major G. D. Fitzhugh, the Manager of this company, has displayed excellent judgment in the location of this property, as regards quality of coal, the position of the vein, and close proximity to the railroad. The company expects to be ready to ship its product by Oct. 1.

The grading of the road to the Warrior Coal & Coke Co.'s mines from the Louisville & Nashville road is completed, and track-laying will begin in a week. This road is 2½ miles long, and has a well-constructed bed. The company has now seven drifts opened on the Pierce seam, which averages from 2 ft. 6 in. to 3 ft. of coal of excellent quality. A notice has been posted by the company notifying its miners that on and after Aug. 1 prices for mining will be reduced from 86 cents to 65 cents a ton at the mouth of the rooms. I understand that all of the companies operating in this section have joined in this movement, and no doubt a strike will result from this action on the part of the companies.

The coal trade throughout this state is unusually dull for this season. Some of the mines are shut down entirely, and have been so for two months, while others are running either on quarter or half time. I know of but four or five companies running full time at present. In fact, the total output from all the mines in the state for the past three months will not exceed 175,000 tons. I have been unable to get reports from the different mines, mainly on account of the dullness of the trade, most operators feeling a delicacy in reporting small business. The Birmingham Mineral Railroad has been opened for business, the road being completed to Bloss mines, 12 miles below this city. It is the best constructed piece of road in this section of the state, well drained, and a good bed.

Of the eight blast furnaces in this section, all are in blast except three. One of these will be blown in very soon.—*Correspondence Engineering and Mining Journal.*

Protecting Sandy Slopes.

The gradual encroachment of the sea upon Fort Stevens has long been a source of anxiety to the government engineers, who have found their efforts thus far fruitless, so that, at times, has been discussed the total abandonment of the post. It is now in contemplation to adopt a plan tried elsewhere with the greatest success. Captain Charles T. Powell, government engineer, has sent F. P. Hennessy, a gentleman of considerable experience, to report as to the practicability of the scheme.

Mr. Hennessy was for many years a civil engineer on the Central Park, New York city, and of late years has won distinction as an originator of a scheme to prevent the shifting of the sands at the Golden Gate Park, San Francisco, of which park he was Superintendent. His latest work has been on that wind-blown stretch of country from The Dalles to Wallula Junction, where he has been eminently successful in his efforts.

Some years ago the New York Park Commissioners sent Mr. Hennessy to Europe, where he traveled extensively for the purpose of acquiring information on this subject. In Holland he found where immense tracts of dunes had been reclaimed from the sea by means of deftly lacing grasses whose interlocking roots reached out and held firm the thin and shaky crust of soil that the ocean beat against. On the shores of the Mediterranean he found where the inhabitants had harrowed in the seeds of the pine, a hardy sea air variety that thrived on the edge of the ocean and as it grew held the soil together, and by its resin, fagots, etc., was a source of revenue to the people. Coming back to San Francisco he found that the European growths were of too slow a character to suit Americans, and collecting lupine seed he sowed that broadcast, finding that to be just the thing required, except that it would have to be renewed every three years.

He then went to the Sandwich Islands, and there found what is called the Honolulu knot grass, which he has used at Golden Gate Park with the happiest results. This grass sends down a root which will run along for 6 or 8 ft. through the sand at a distance of 6 in. from the surface, and then send up a stalk, so that in a short time the whole area is so firmly held by the myriads of clinging roots as to defy the wrathful surge that ever thundered along the shore.

Of late he has been superintending the planting of a species of wild rye on the line from The Dalles to Wallula. This is found to serve the purpose admirably and will eventually reclaim considerable land in that section of country. Mr.

Hennessy goes to Point Adams lighthouse this morning and will make a thorough survey of the matter.—*Portland Oregonian.*

Smoke Consuming Locomotives.

The New York Central & Hudson River Co. has recently fitted up one of its passenger locomotives with a smoke consuming apparatus, consisting of an arrangement of steam jets in the fire-box, to promote the combustion of the smoke and gases. On an experimental trip it is said to have worked very well.

Preventing Accidents.

The following circular has been issued by General Manager Frederick Broughton, of the Chicago & Atlantic Railway, under date of July 1:

"Great loss having been suffered by the company, through casualties which might have been obviated, the attention of the employees is called to the necessity of exercising the utmost care to prevent accidents. The rules attached to the working time-tables contain nearly all the information necessary for their guidance, but the staff in the different departments should use caution and judgment in carrying out their duties, which every man is supposed to understand before he is appointed to fulfill them.

"1. Each ganger of the permanent way is responsible for having the proper signal displayed before taking up a rail or doing anything else to obstruct the line.

"2. Great care should be exercised by conductors and brakemen in regard to hot boxes. No car should be run if there is danger from this cause, but it should be switched out at the first available siding.

"3. All trains should be held in control so that they can be stopped at grade crossings or swing bridges. Car brakes are frequently rendered ineffective by brakemen and yardmen sitting on the wheel of the brake-mast. This practice must be discontinued.

"4. Cattle are frequently killed by injudicious driving. When a train meets or overtakes cattle on the track a succession of short whistles should be given, with the object of driving them to one side of the track, and the speed of the train abated so that they may be passed. The sectionmen should then run them off the company's right of way at the nearest gate. Section foremen will be held responsible for cattle entering on the company's property.

"5. The use of a red flag at telegraph stations to stop trains for orders will be discontinued, as soon as possible, and an order signal gradually substituted. Station agents should see that all signal lamps are carefully and properly trimmed, and engineers will keep a careful lookout before approaching a station for the order signal, which will be a red disk about 7 to 8 ft. above the platform by day, and a red lamp about 1 ft. higher by night.

"6. Yardmen will be careful, in shunting, not to damage rolling stock, but by taking necessary precaution, in signaling, prevent violent shunting and consequent damage therefrom.

"With the object of protecting the public, by insuring as far as possible the safe working of the line, every casualty, however slight, will be investigated by a committee composed of the heads of departments. All the employees concerned in an accident will be suspended from duty until it can be carefully inquired into, by which means it is hoped that the cause may be discovered and a recurrence prevented.

"I hope that all will cheerfully aid me in carrying out these regulations, and in doing everything necessary to insure the safe and economical working of the railway, by endeavoring so to conduct their duties as to avoid such accidents as may be prevented by carefulness and attention."

Rubennick's Metalized Wood.

Rubennick's process for metalizing wood consists in steeping the wood in a caustic alkali for two or three days, according to its degree of permeability, at a temperature between 164 deg. and 197 deg. Fab. The wood is then placed in a second bath of hydrosulphate of calcium, to which is added, after 24 or 38 hours, a concentrated solution of sulphur. After 48 hours the wood is immersed in a third bath of acetate of lead at a temperature between 95 deg. and 122 deg. Fab., where it remains from 30 to 50 hours. After a complete drying the wood thus treated is susceptible of a very fine polish, especially if its surface is rubbed with a piece of lead, tin or zinc, and finally finished with a burnisher of glass or porcelain. It then looks like a metallic mirror, and is completely sheltered from all the deteriorating effects of moisture.—*Engineer.*

A "20-Horse" Boiler.

Engineers and professional men, and not unfrequently luminaries of the law, are continually coming across instances of misunderstanding and dispute, arising from the use of that unfortunate term "nominal" horse power. Many who like to be thought "knowing" on engineering matters are fond of speaking of any particular engine or boiler as being a "40-horse" boiler, a "60-horse" engine, etc., etc., as the case may be. It sounds, they think, to others as though they understood what they were talking about, whereas they have not the slightest idea themselves. They do not use the term nearly so intelligently as did the spouse of a well-known engineer who some time ago told her husband on coming home in the evening the interesting piece of news that a "20-horse" boiler had gone past the house that afternoon. "A '20-horse' boiler?" exclaimed the astonished man of steam; "Why, how do you know it was a '20-horse'?" "Because," replied the lady with a smile of satisfaction at her acuteness and penetration in having at length discovered the meaning of a term she had so often heard used by her husband and his friends, "because it was drawn by 20 horses." Isn't that what you mean by a 20-horse boiler? If everybody who now uses the term could give when asked as clear an explanation of what they mean, there would certainly be less confusion than at present exists respecting it.—*Mechanical World.*

Railroads in Guatemala.

The railway in course of construction in Guatemala from the port of San José to the capital is progressing rapidly. Numberless difficulties have been encountered by the engineers, among which may be mentioned many bridges over "barrancos"—deep and wide fissures of volcanic origin—the enormous quantity of water accumulating suddenly in the rainy season, the unhealthiness of the lower parts of the line near the coast, the building of an embankment across the lake of Amatitlan, and a rise of 5,000 ft. from the sea to the capital, a distance of about 80 miles, 4,000 ft. of which have to be surmounted in the last 50 miles. The line is practically finished for three-quarters of the distance, and by September next at the latest, unless some unforeseen accident occurs, the trains will reach the capital, Guatemala, enabling passengers and merchandise to reach the port in three or four hours, instead of, as at present, by diligence or ox-cart, in any time from 12 hours to 10 days. There are no other railways in the republic either open or in course of construction, but a project for a railway from Santa Thomas to Guatemala is being actively prosecuted by the government. It is proposed to build this railway entirely by a national forced and voluntary subscription. Everybody is at liberty to buy shares, and natives who do not so voluntarily become shareholders by compulsion under an income tax law which came into force Jan. 1, 1884. The cost of the line is

estimated at \$12,000,000, which are to be raised during the 10 years required for the construction of the railway. Preliminary works have already been commenced.—*London Engineer.*

Late advices announce the completion of the road from San José to the city of Guatemala, some two months earlier than the time appointed.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Manhattan, adjourned special meeting, at the office in New York, Aug. 1.
Metropolitan Elevated, special meeting, at the office in New York, July 31.
New York Elevated, adjourned special meeting, at the office in New York, Aug. 1.
Norfolk Southern, annual meeting, at the office in Elizabeth City, N. C., Aug. 15, at noon.
Poughkeepsie & Southwestern, annual meeting, at No. 97 Nassau street, New York, Aug. 20, at noon.
Rutland, annual meeting, at the office in Rutland, Vt., at 3 p. m. on July 30.
St. Paul, Minneapolis & Manitoba, annual meeting, in St. Paul, Minn., Aug. 15.

Dividends.

Dividends have been declared as follows:

Pullman Palace Car Co., 2 per cent., quarterly, payable Aug. 15, to stockholders of record Aug. 1.
St. Paul & Duluth, 7 per cent. on the preferred stock, payable in new preferred stock Aug. 1, to stockholders of record July 15.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

Traveling Passenger Agents' Association, annual meeting, in Denver, Col., on Tuesday, Aug. 12.
Western Association of General Passenger & Ticket Agents, adjourned meeting, in Minneapolis, Minn., on Wednesday, Aug. 13.
Train Dispatchers' Association, preliminary meeting, to form an association, in Louisville, Ky., on Wednesday, Aug. 20.
Master Car Painters' Association, annual convention, in Boston, on Wednesday, Sept. 3.
Road-Masters' Association of America, annual convention, in Indianapolis, Ind., on Wednesday, Sept. 10.
Association of American Railroad Superintendents, semi-annual meeting, in Boston, on Tuesday, Sept. 16.
National Association of General Passenger & Ticket Agents, semi-annual convention, in Boston, on Tuesday, Sept. 16.
New England Railroad Club, first monthly meeting for the season, at the rooms in the Boston & Albany station in Boston, on Wednesday, Sept. 24.
New England Road-Masters' Association, annual convention, at White River Junction, Vt., on Wednesday, Oct. 8.
General Time Convention, fall meeting, at the Continental Hotel, Philadelphia, on Thursday, Oct. 9.
Southern Time Convention, fall meeting, at No. 46 Bond street, New York, on Wednesday, Oct. 15.
American Street Railway Association, annual convention, in New York, on Wednesday, Oct. 15.

Foreclosure Sales.

The *Montgomery Southern* road was sold at public sale, under a decree of the Chancery Court, in Montgomery, Ala., last week, and bought for \$81,000 by Josiah Morris as trustee for the creditors. Before the sale the attorney for the trustees stated that certain subscription notes of parties in Crenshaw County did not pass with the sale. The administrator of the estate of B. Reynolds stated that the right of way through the estate's land had never been paid for, and that the right would be enforced. The decree of the Court was in favor of certain bondholders who advanced money and took the bonds as collateral. The total amount due on the bonds hypothecated on June 1, 1884, was \$131,394. The bondholders are nearly all citizens of Montgomery. The road is of 3 ft. gauge, and is in operation from Montgomery to Ada, 20 miles.

Baltimore & Ohio Employees' Relief Association.

The June sheet of this association shows a total of 841 payments during the month, as follows: Main Stem, Transportation Department, 99; Machinery Department, 254; Road Department, 107; Baltimore & Philadelphia, 1; Pittsburgh Division, 72; Trans Ohio divisions, 190; physicians' bills, 118; total, 841. The largest single payment was one of \$2,000 to the widow of J. A. Graft, a locomotive engineer who was accidentally killed. There were also four payments of \$1,000 each for deaths.

General Baggage Agents' Association.

The semi-annual meeting of this Association was held in Boston, July 16, the sessions continuing the following day. The attendance was large and and Vice-President J. J. Post presided.

The usual routine business occupied the time of the convention, no new business of special importance being brought up or acted on.

At the close of the meeting a number of the members went on an excursion to Bar Harbor and Mt. Desert.

Train Dispatchers' Association.

A meeting of train dispatchers was held in Buffalo, July 22, for the purpose of completing a local organization and selecting delegates to the National Convention at Louisville.

A largely-attended meeting of train dispatchers was held in Kansas City, Mo., July 19, at which Mr. E. J. Perry was chosen Chairman and Mr. S. C. Stewart Secretary. After full discussion, the following resolutions were adopted:

"Resolved, That the Secretary be instructed to issue cards of inquiry to each train dispatcher within a reasonable distance, asking the name of dispatchers who can and will attend the meeting of the National Dispatchers' Association at Louisville, Aug. 20, and further, that the Secretary issue to all who will go certificates of delegation.

"Resolved, That we combine ourselves into an association that will be subject and subordinate to the constitution and any decision which may be rendered by the National Dispatchers' Association.

"Resolved, That there be three delegates appointed from among those present at this meeting, who shall attend the meeting of the National Association, and to whom shall be sent all proxies of dispatchers who cannot attend.

"Resolved, That it is in the sense of this meeting that it must be impolitic for the Train Dispatchers' Association to act in any manner upon the question of salaries or number of hours' work of dispatchers.

"Resolved, That an invitation be extended to the National Association to hold its next annual convocation at Kansas City."

Messrs. A. A. Branin, A. P. Forman and H. F. Tracy were chosen delegates to the Louisville convention.

The local association formed at the meeting held in Fort Worth, Tex., of which an account has been already given is now fully organized and at work under the constitution adopted.

ELECTIONS AND APPOINTMENTS.

Central Pacific Leased Lines.—At a meeting held in San Francisco recently, officers were chosen as below for the lines named, which are leased or controlled by the Central Pacific Co.: **Amador Branch.**—Leland Stanford, President; Charles Crocker, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary. **Berkeley Branch.**—Leland Stanford, President; George Crocker, Vice-President; W. V. Huntington, Secretary; Timothy Hopkins, Treasurer. **California Pacific.**—Chas. F. Crocker, President; N. T. Smith, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary; Directors, George Crocker, J. L. Willcutt, W. E. Brown. **Modesto, Tuolumne & Mono.**—Leland Stanford, President; Charles Crocker, Vice-President; W. V. Huntington, Secretary and Treasurer. **Northern.**—W. V. Huntington, President; Charles F. Crocker, Vice-President; E. H. Miller, Jr., Treasurer; Timothy Hopkins, Secretary. **Sacramento & Placerville.**—Leland Stanford, President; Charles F. Crocker, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary. **San Pablo & Tulare.**—Leland Stanford, President; Charles Crocker, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary. **Stockton & Copperopolis.**—Leland Stanford, President; George Crocker, Vice-President; W. V. Huntington, Secretary; Timothy Hopkins, Treasurer. **Terminal.**—Leland Stanford, President; C. P. Huntington, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary. **Vaca Valley & Clear Lake.**—A. M. Stevenson, President; Leland Stanford, Vice-President; Timothy Hopkins, Treasurer; W. V. Huntington, Secretary. **Winters & Ukiah.**—S. T. Gage, President; W. T. Smith, Vice-President; W. V. Huntington, Secretary; Ariel Lathrop, Treasurer.

Central Union Station & Railroad Co. of Cincinnati.—The officers of this company are as follows: President, M. E. Ingalls; Secretary and Treasurer, T. O. Barbour; Directors, M. E. Ingalls, J. H. Devereux, H. H. Poppleton, E. B. Thomas, E. F. Osborn, T. O. Barbour.

Lake Shore.—This company has been organized by the election of the following directors: J. F. Cloudman, A. Nute, Farmington, N. H.; B. F. Drake, Lake Village, N. H.; C. A. Busiel, Stillson Hutchins, Wm. S. Moulton, S. S. Wiggins, Laconia, N. H. The board elected C. A. Busiel, President; C. F. Stone, Clerk; W. L. Melcher, Treasurer.

Louisville, New Albany & Chicago.—Col. W. H. McDoel has been appointed General Freight Agent, to date from Aug. 1, in place of A. B. Southard, resigned. Col. McDoel was formerly General Freight Agent of the Hannibal & St. Joseph, but for some time past has been General Southwestern Agent of the Chicago, Burlington & Quincy.

Massachusetts Railroad Commission.—The Massachusetts Executive Council has rejected the nomination of Mr. Edward I. Thomas as Railroad Commissioner. The Governor has not yet sent in any other name.

Mexican Central.—Mr. Isaac T. Burr, of Boston, has been chosen President pro tem, in place of Mr. Thomas Nickerson, resigned.

New York Central & Hudson River.—The following circular has been issued by General Freight Agent E. Clark, Jr.:

"The General Western Freight Agent's office of this company, located in Buffalo, will be discontinued July 15. Mr. James McFeggan, who for several years has acted as General Western Freight Agent, has been appointed General Agent of this company in charge of the freight stations at western termini, and will assume such duties the 15th, aided by agents as follows: East Buffalo station, S. M. Slocum, agent; Ohio street station, E. K. Clark, assistant agent; Green-street station, R. A. Manning, agent; Erie-street station, J. A. Barton, agent; Black Rock station, J. A. Barton, agent; Suspension Bridge station, D. J. Barton, agent. All communications relating to the general business of these stations should be addressed to James McFeggan at Green-street station."

Rome.—At the annual meeting in Rome, Ga., July 17, the following officers were elected for the ensuing year: Eben Hillier, President. Directors, Daniel S. Printup, W. G. Raoul, D. M. Hood, George Hillier, D. B. Hamilton and S. S. Johnson. The following officers were appointed: James A. Smith, General Freight and Passenger Agent; H. A. Pattillo, General Bookkeeper; O. W. Harbin, Master Mechanic.

Toledo, Cincinnati & St. Louis.—Mr. George Hafer has been appointed Receiver of the Cincinnati Northern Division. The sale of the other divisions south of Delphos separates this division entirely from the main line, making a distinct management necessary.

United States Central.—Mr. Samuel P. Warren, of San Francisco, has been chosen Treasurer of this company, and H. H. Russell has been appointed Right-of-way Agent.

Wabash, St. Louis & Pacific.—General Traffic Manager James Smith has appointed M. Knight General Freight Agent; H. B. McClellan, General Eastern Agent; E. O. Hudson, Commercial Agent at St. Louis; W. H. Smith, Commercial Agent at Kansas City.

Western & Atlantic.—Mr. C. W. Seidell has been appointed General Claim Agent in place of L. C. Jones, resigned. Mr. Wm. Hamilton succeeds Mr. Seidell as Forwarding Agent at Atlanta.

Wheeling & Lake Erie.—Mr. M. D. Woodford (Vice-President and General Manager of the company) has been appointed Receiver in a suit to foreclose the first mortgage.

PERSONAL.

—Mr. L. C. Jones has resigned his position as General Claim Agent of the Western & Atlantic road.

—Mr. F. M. Pomeroy has resigned his office as General Freight and Passenger Agent of the Ozdensburg & Lake Champlain road, to accept a position on the Southern Central road.

—Edward York, late Chief Engineer of the Pacific Branch of the Mexican Central Railway and formerly connected with public works in California, was drowned near San Bernardino, Cal., on May 25 last.

—Mr. George A. Coolidge has resigned his position as Superintendent of Motive Power of the Fitchburg Railroad. He has been on the road for 30 years and has had charge of the Motive Power Department for 18 years past.

—Mr. F. E. Merrill, who recently resigned his position as Superintendent of the Buffalo Division of the New York, West Shore & Buffalo road, has been presented with a valuable gold watch by the employees on his late division.

—Mr. A. B. Southard has resigned his position as General Traffic Manager of the Louisville, New Albany & Chicago road, to take effect Aug. 1. He has been connected with the road for several years, and was previously with the Wabash.

—Mr. Thomas Nickerson has resigned his position as President of the Mexican Central Railway Co. He has contemplated taking this step for some time past, on account of his health and increasing age, believing that the duties of the position could be best performed by a younger and more active man. Mr. Nickerson will shortly take a trip to Europe for the benefit of his health.

—We announced last week that Mr. A. H. Braithwaite, the designer of an engine which competed with George Stephenson's "Rocket," had died in New Zealand. It appears that this was a mistake. We regret that we cannot add, as usual, that the gentleman reported to be dead is alive and well. In this case it is quite the other way, as John Braithwaite, the real Simon Pure, died 10 years ago, and Mr. A. H. Braithwaite was his brother, but had little to do with the design of the engine.

—A dispatch from St. Paul, Minn., July 17, says: "D. E. Swan, Chief Clerk in the Local Treasurer's office of the Northern Pacific Railroad, is a defaulter. He was arrested at White Bear yesterday, where he had secreted himself in the woods. He had attempted to commit suicide by taking morphine. His books were examined last night and the amount of his deficit found to be over \$5,000. He will be brought here to-day for an examination. Swan was once wealthy, but lost his money by the failure of a New Jersey bank. The money which he took from the railroad company was used in speculation in Wall street."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Six months ending June 30:				
	1884.	1883.	Inc. or Dec.	P. c.
Ala. Gt. South.	\$519,688	\$480,659	I.	\$39,029 8.1
Cin. N. O. & T. P.	1,210,313	1,157,472	I.	52,841 4.4
Des. M. & Ft. D.	155,989	136,406	I.	19,583 14.4
E. Ten. Va. & G.	1,832,484	1,791,257	I.	41,227 3.4
Kansas City, Ft. Scott & Gulf.	1,152,702	881,179	I.	271,523 30.8
Kan. City, Spr. & Mem.	538,002	.....	.....	.....
Marq. H. & O.	346,913	291,594	I.	55,319 22.6
Mo. Kan. & Tex.	3,317,432	3,369,015	D.	51,583 1.5
Nash. C. & St. L.	1,145,181	1,101,990	I.	43,191 3.9
N. O. & N. East.	493,658	478,191	I.	15,467 3.2
Pennsylvania	189,737	38,607	I.	151,070 390.7
Pennsylvania	23,333,256	24,332,586	D.	1,019,330 4.2
St. L. Alb. & T. H.	8,112,040	8,518,624	D.	406,584 4.8
Main Line.	677,690	688,912	D.	11,220 1.6
Belleville Line.	378,591	393,348	D.	14,757 3.7
Texas & St. L.	359,939	.....	.....	.....
Vicksburg & Mer.	224,134	227,946	D.	3,812 1.7
Vicks. Shreve. & Pacific.	58,853	39,810	I.	19,043 48.1
Va. Midland.	732,704	736,694	D.	3,990 0.5
Five months ending May 31:				
Ala. Gt. South.	\$689,552	\$644,455	I.	\$45,097 7.0
Union Pacific.	9,300,995	10,696,125	D.	1,395,230 13.0
Net earnings.	3,243,067	5,270,921	D.	2,027,854 38.4
Month of May:				
Ala. Gt. South.	\$156,675	\$148,429	I.	\$8,246 5.6
Union Pacific.	2,112,342	2,351,012	D.	238,670 10.2
Net earnings.	942,475	1,127,315	D.	184,840 16.4
Month of June:				
Ala. Gt. South.	\$79,893	\$72,225	I.	\$7,668 10.6
Cin. N. O. & T. P.	205,490	208,826	D.	3,336 1.6
Des. M. & Ft. D.	32,725	22,668	I.	10,057 4.6
E. Ten. Va. & G.	296,015	260,864	I.	35,151 13.5
Kansas City, Ft. Scott & Gulf.	180,132	129,367	I.	50,765 44.1
Kan. City, Spr. & Mem.	112,708	.....	.....	.....
Marq. H. & O.	147,232	104,935	I.	42,297 40.3
Nash. C. & St. L.	161,956	170,660	D.	8,704 5.1
Net earnings.	79,889	83,768	D.	3,879 4.9
N. O. & N. East.	28,419	7,345	I.	21,074 286.9
Pennsylvania	3,906,175	4,156,972	D.	250,697 6.0
Net earnings.	1,083,019	1,179,135	D.	96,116 8.2
St. L. Alb. & T. H.	.....	.....	.....	.....
Main Line.	92,227	91,955	I.	272 0.3
Belleville Line.	55,558	57,048	D.	1,490 2.6
Vicksburg & Mer.	31,734	27,870	I.	3,864 13.8
Vicks. Shreve. & Pacific.	9,770	5,224	I.	4,546 87.3
Virginia Midland.	128,433	131,313	D.	2,880 2.2
Two weeks in July:				
Ala. Gt. South.	\$18,798	\$18,035	I.	\$763 4.2
Second week in July:				
Burr. C. R. & N.	\$41,684	\$44,725	D.	\$3,041 7.2
Canadian Pacific.	118,000	118,000	I.	35,000 29.6
Chi. & Alton.	181,377	180,903	I.	474 0.3
Chi. & East. Ill.	30,260	28,854	I.	1,406 4.8
Chi. Mil. & St. P.	428,000	411,661	I.	16,339 4.0
Chi. & Norwest.	436,500	476,200	D.	39,700 8.4
Chi. St. P. Min.	.....	.....	.....	.....
O. & O.	85,100	100,370	D.	15,270 17.9
Long Island.	84,756	84,652	I.	104 0.1
Mil. L. S. & W.	23,600	18,820	I.	4,780 20.1
No. Pacific.	209,365	186,000	I.	23,365 12.6
Robt. & Pitts.	25,859	14,335	I.	11,524 82.0
St. L. & S. F.	81,500	59,400	I.	22,100 37.4

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

Grain Movement.

For the week ending July 12, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Northwestern shipments.		Atlantic receipts.	
Year.	Receipts.	Year.	Receipts.
1877.....	4,156,595	1877.....	2,293,369
1878.....	4,330,960	1878.....	3,412,025
1879.....	4,379,964	1879.....	5,842,183
1880.....	5,788,152	1880.....	7,954,291
1881.....	5,105,048	1881.....	5,746,634
1882.....	3,433,226	1882.....	2,265,410
1883.....	3,021,566	1883.....	2,517,564
1884.....	2,985,898	1884.....	2,152,185

The receipts of the Northwestern markets for the week this year were smaller than in the corresponding week of any of the seven preceding years, but only a little less than last year. They were 271,000 bushels more than in the preceding week of this year, but with that exception were the smallest for eight weeks.

The shipments of these markets, however, were larger than in the corresponding weeks of last year and the year before, though much less than in 1880 and 1881. They were no less than 1,103,000 bushels more than in the previous week of this year, but were less than in any other week since March. The rail shipments were exceeded only in 1879 and 1881, but with the exception of the previous week they were the smallest of this year. The shipments down the Mississippi were only 64,438 bushels. The lake shipments were the largest of the year, except the week of the opening, when the whole fleet started down.

The Atlantic receipts for the week were even smaller than in the corresponding week of any other year in the table,

583,000 bushels less than the week before, and the smallest for eight weeks. They were especially small at New York, which received but 32.6 per cent. of the total, and not half as much as the week before.

The exports from Atlantic ports for the week ending July 12 have been:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.....	145,636	98,836	125,676	107,039	101,896
Grain, bu.....	6,461,703	4,698,011	1,757,294	2,245,903	2,083,908

Thus the exports this year were a little less than last year something more than in 1882, but very much less than in 1880 and 1881.

Coal.

Coal tonnages for the week ending July 12 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite.....	903,431	310,630	I.	592,801 190.6
Eastern bituminous.....	176,226	185,819	D.	9,593 5.2
Coke.....	57,167	58,238	D.	1,071 1.8

In anthracite, a week of total stoppage is followed up by one of enormous shipments. Trade is still reported dull, although the orders for eastern shipments should now be large.

Cumberland and Clearfield shipments were again heavy, and gas-coal shipments were also large. The eastern bituminous trade is doing well, in spite of the smaller market in the iron districts.

The coal tonnage of the Pennsylvania Railroad for the week ending July 12 was:

Line of road.	Coal.	Coke.	Total.
From other lines.....	135,046	49,498	184,544
From other lines.....	55,340	7,669	63,009
Total.....	190,386	57,167	247,553

The total tonnage this year to July 12 was 6,887,355 tons, against 6,270,693 tons to the corresponding date last year, an increase of 616,662 tons, or 9.8 per cent.

The percentages of the total anthracite output for the six months ending June 30, contributed by the several companies, as shown by the Official Accountant's statement published last week, were as follows, New Jersey Central tonnage being included with the Reading in both years:

	1884.	1883.	Inc. or Dec.	P. c.
Philadelphia & Reading.....	35.8	38.5	D.	2.7
Lehigh Valley.....	19.7	20.3	D.	0.6
Delaware, Lackawanna & Western.....	17.0	15.8	I.	1.2
Delaware & Hudson Canal Co.....	10.8	10.9	D.	0.1
Pennsylvania Railroad.....	11.0	8.6	I.	2.4
Pennsylvania Coal Co.....	4.5	4.7	D.	0.2
New York, Lake Erie & Western.....	1.2	1.2	.....	.....
Total.....	100.0	100.0	.....	.....

The marked changes are the decrease in the Reading's proportion, that company bearing three-fourths of the total decrease in tonnage this year, and the considerable gains by the Pennsylvania Railroad Co. and the Delaware, Lackawanna & Western. The other companies show only very slight changes in their proportions of the total tonnage.

The coal tonnage of the Chesapeake & Ohio Railroad for the six months ending with June was:

	1884.	1883.	Decrease.	P. c.
Coal.....	434,274	481,593	47,319	9.8
Coke.....	29,160	28,065	1,095	49.8
Total.....	463,434	509,658	46,224	14.1

The falling off was in gas coal and in splint and block coal, the steam coals showing a small gain.

Cumberland coal tonnage for the week ending July 19 was 67,967 tons. The total tonnage this year to July 19 was 1,469,692 tons, against 1,261,806 tons to the corresponding date last year, an increase of 207,886 tons, or 16.5 per cent.

Cotton.

Cotton movement for the week ending July 18 is reported as follows, in bales:

	1884.	1883.	Inc. or Dec.	P. c.
Interior Markets.....	3,330	4,292	D.	962 2.2
Rec-pts.....	7,027	8,825	D.	1,798 20.4
Shipments.....	28,244	64,230	D.	35,985 56.2
Exports:				
Receipts.....	3,810	9,208	D.	5,398 58.7
Exports.....	22,919	20,712	I.	2,207 10.7
Stock, July 18.....	253,622	337,676	D.	84,054 24.9

The total movement from plantations for the cotton year from Sept. 1 to July 18 is estimated at 5,643,377 bales; the decrease, as compared with last year, is 1,285,269 bales; the increase as compared with 1881-82 is 314,979 bales, and the decrease from 1880-81 is 829,747 bales.

Petroleum.

The production of the Pennsylvania and New York oil wells for June is given by Stowell's Petroleum Reporter as follows, in barrels of 42 gallons:

	1884.	1883.	Inc. or Dec.	P. c.
Production.....	1,869,190	1,977,900	D.	115,710 5.9
Shipments.....	1,827,555	1,747,789	I.	79,766 4.6
Stock.....	38,665,838	35,985,935	I.	2,679,903 7.4
Producing wells.....	21,658	17,050	I.	4,608 27.1

The production was the smallest since January, and was exceeded in nine months of last year and eleven months of 1882. Of the total the Allegheny District in New York contributed 13.1 per cent.; the Bradford District in Pennsylvania, 54.9; the Warren District, 18.9, and the Lower District, 13.1 per cent.

Shipments were exceeded in March and May of the present year, in six months of last year and in five months of 1882. They were very nearly equal to the production.

Stock was increased during the month by 34,635 barrels, which was the excess of the production over shipments. During the month there were 244 new wells completed, the smallest number since February. The number of new wells was also exceeded in six months of last year and in seven months of 1882. There were 29 dry holes reported and 123 new wells in process of drilling at the close of the month.

Shipments for the month were as follows:

	Barrels.	Per cent. of total.
New York.....	537,891	29.4

writing. Nothing new was developed on the Cooper tract during the month, and the Henry Mills field is producing very little in comparison with its former output. The Bradford and Alleghany fields show the greatest decrease in operations, almost nothing worthy of mention being done in these fields during the month under review.

Wheat Production in India.

The English *Western Morning News* says: "The committee on Indian railways has completed its inquiries and is now considering its report. The last witness was Dr. W. W. Hunter, Chief of the Indian Statistical Department, who gave some interesting information last week about the supposed cost of wheat-growing in India. Basing his estimates upon the results of some experiments carried out by the Indian Government, Dr. Hunter said that at 16s. to 18s. per quarter the cultivators would undoubtedly obtain a profit, while at the latter price they would greatly increase their wheat acreage. But he went on to show that in order to pay the cultivator 18s. per quarter the price of Indian wheat after its arrival in England must be 44s. per quarter, whereas it is now selling at about an average of 34s. in London. Therefore, unless the Indian cultivator will be satisfied with less than 18s., the only way to induce him to grow more wheat will be to diminish the cost of transit. Partly with that end in view, it is proposed by the Indian Government that a number of new railroads in different parts of India should be constructed, and that grain should be carried on them at low rates. The world grows an abundance of wheat already, and there is no need to stimulate the increased cultivation of that cereal; but as America virtually refuses to take our manufactures, it would be a good thing to be able to do without her wheat. With fair opportunities there is reason to believe that the Indian ryot would be able to undersell the American farmer, and as India takes our manufactures in exchange for her products, it is to our interest to buy all the wheat we can of her. To the British farmer it is of very little consequence how much wheat India grows, because, without any wheat from India, we are certain to have our market flooded with the grain for many years to come, up to the limit of our consumption; and we cannot go beyond that. If we take more wheat from India, we shall take less from other countries—that is all."

Jeweler's Sample Trunks.

Mr. A. H. Hanson, General Passenger Agent of the Illinois Central, was on Tuesday appointed a committee of one by the Chicago Railroad Association to consider the subject of carrying jeweler's sample trunks in baggage cars. He has written the following letter to the general passenger agents of the roads interested, as his report:

"I herewith inclose a circular, over the signature of our General Baggage Agent, in connection with the regulation in effect on this line as to the non-transportation in baggage cars of sample jewelry trunks. Chicago sends out about 100 traveling men with as many trunks, averaging in value about \$6,500 each. Some of them range in value from \$10,000 to \$15,000, and even as high as \$20,000. I have been informed by our General Solicitor, Mr. B. F. Ayer, that we can take no release that will relieve us from the results of negligence or carelessness on the part of our employees. In view of this fact, I consider that the risk we were running was altogether too great. I decided to discontinue receiving sample jewelry trunks as baggage, and requested the owners to turn them over to the express companies. A committee of the Chicago Jewelers' Association has written me, protesting against our action, claiming that we were the only line taking it.

"I brought the matter up yesterday at the meeting of the Chicago Association, and was appointed a committee of one to confer with the general passenger agents in the association as to the advisability of making the rule a general one. I might say that several members who were present, agreed with me that the risk they were taking on this particular class of sample baggage was a startling one. Will you kindly give the matter your thought and attention and be prepared at the next meeting of the association to take such action as you think for the best interests of your line?"

—Chicago Inter-Ocean.

Boston Traffic Notes.

During the month of June 6,665 loaded freight cars passed through the Hoosac Tunnel bound eastward, against 5,345 for the corresponding month in 1883, an increase of 1,120.

RAILROAD LAW.

Damages to Adjoining Property.

In the case of *Fellers against the Republican Valley Co.*, the Nebraska Supreme Court affirms the judgment of the lower court, holding as follows:

1. The sale of a lot or parcel of ground to a railroad company for right of way purposes, and the receipt of the consideration therefor does not estop the owner from claiming damages to other remote and detached real estate injuriously affected by the construction of such railroad, and such sale will not be held to be as full satisfaction for all damages to other property unless such was the intention of the parties at the time of making a contract.
2. Where real estate is damaged by the construction of a railroad, but no part thereof is appropriated to the use of such road, an action at law for such damages may be maintained.
3. Where it is claimed that instructions given to a jury were too general, and where a more explicit charge was not requested, the objection cannot be entertained.

OLD AND NEW ROADS.

Baltimore & Ohio.—The contract for the grading and masonry of the Philadelphia branch of this road, between Wilmington and Philadelphia, has been let to Ryan & McDonald, of Syracuse, N. Y. The contract price is nearly \$2,000,000, it is said.

Boston & Lowell.—A dispatch from Boston, July 23, says: "The directors of this company held a meeting yesterday afternoon. A number of questions growing out of the recent union of the line with the Boston, Concord & Montreal and other roads received consideration, and it is understood that a traffic contract with the Concord Co. for five years was agreed upon. This includes also the Nashua & Acton line, showing that the published report that the Fitchburg Co. was about to get it was untrue. The exact terms of the arrangement are not as yet known."

Boston & Maine.—On the eastern end of this road the second track is now completed from Portland, Me., to Old Orchard, 12 miles, and trains are running over it. A further extension of the second track from Old Orchard to Biddeford, 5 miles, will soon be ready for use.

Buena Vista.—The grading of this road is now completed from Buena Vista in Marion County, Ga., eastward to the junction with the Southwestern Division of the Central Railroad, of Georgia, a distance of 26 miles. Tracklaying was to be begun this week by the Central Railroad Co., which will iron and operate the line.

Chesapeake & Ohio.—The Richmond (Va.) *State* says: "The Chesapeake & Ohio Co. has recently placed automatic electric signals at Church Hill, Lewis and Alleghany tunnels. The signals at each end of the tunnel will show clear when the track between them is unobstructed, but when a train is approaching the tunnel, as soon as the engine passes the signal post the signal changes from clear to red, which indicates that a train is passing through the tunnel. If, when the train is passing through the tunnel, a car should become uncoupled and left on the track, or a rail is broken or displaced, the signal will show the danger signal—the red light—and no train will enter the tunnel until the flagman goes ahead, and ascertains what the trouble is."

Chicago, Burlington & Quincy.—The cross-cut or short line from the main line of the Burlington & Missouri River road at Kennesaw, Neb., southwest to Oxford on the Republican Valley line is now completed and has been opened for traffic. The original Republican Valley line runs from Hastings due south 37 miles to Amboy and then turns due west, and the new cut-off runs diagonally across the right angle so formed. It is 61 miles long and reduces the distance from Hastings to Oxford by 30 miles, making a corresponding reduction in the distance run by the through trains to Denver, which pass over this line.

Chicago, Milwaukee & St. Paul.—A dispatch from London, England, July 19, says: "The \$800,000 worth of Chicago, Milwaukee & St. Paul 5 per cent. gold bonds which Messrs. Blake Brothers & Co. put on sale on the London market yesterday were promptly subscribed for at the rate of 96 per cent. London insurance companies and Hamburg merchants formed the bulk of the purchasers."

Chicago & Western Indiana.—The Chicago *Inter-Ocean* gives the following account of the new passenger station which this company will shortly build in Chicago prepared from official information from the architect, Cyrus L. W. Eidlitz, of New York, and J. T. Allen, Superintendent, Chicago: "The structure fronts 218 ft. on Polk street, with a building 40 ft. wide and 446 ft. long on Third avenue and one 200 ft. long on Fourth avenue. The height of the wings on Third and Fourth avenues is 40 ft. from the street level. Between these wings and continuing a distance of 600 ft. south will be a train shed, which will be 135 ft. across between the buildings and widening to 165 ft. between these and will be 60 ft. to the ridge of the roof, joining with that of the main building. The main building on Polk street will be three and one-half stories on the corners, with two and one-half stories between. Between the centre of the front and the Fourth avenue side will be a tower 195 ft. in height. The main building will have a half-story course of brown sandstone, except the main entrance under the tower and lobby, which will occupy the Third avenue corner, and these will be of this stone to the second story. The remainder of the walls will be of Philadelphia pressed brick, with courses of molded brick and elaborate cornices, spandrels, and other ornamentations of terra cotta. All the stone work about the main building will be elaborately carved, and like the terra cotta will represent some possibilities in carved work never before shown in Chicago buildings, all being from original designs by the architect. The entire roof will be of slate. That upon the main building will be of red slate with green diamonds, and the remainder of green slate. The first floor of the main building will be one grand waiting-room. The corner on Third avenue will be a special feature, as the main entrance and lobby will be located there. This will be finished entirely in enameled brick and terra cotta, the floor of tile and the ceiling of hardwood. The entire floor is finished in this manner, and enameled brick of varied colors in the walls forming a bright and pleasing interior, the elaborate cornice of red terra cotta contrasting admirably with it. The tower entrance is similar in finish to that of the lobby, but less elaborate. The second floor will be devoted to the general offices of the railroad company and will be finished in hardwood with parquet floors. The 10-ft. basement below the main building will contain the closets, barber-shop, kitchen for the restaurant, storage, etc. The wing on Third avenue will be divided into a dining-room 80 ft. long and the remainder will contain a baggage-room. That on Fourth avenue will have a ladies' waiting-room opening from the lobby, and the remainder of the wing will contain baggage and express rooms, with emigrant quarters beneath in the well-arranged 10-ft. basement."

Demopolis, Leeds & Gadsden.—Surveys have been made for a section of this projected road from Leeds, Ala., down the Cahaba Valley to the mines owned by the Sloss Furnace Co., a distance of 6 miles. This section will be built at once.

Detroit, Mackinac & Marquette.—Surveys are to be begun at once for the extension of this company's Marquette & Western line to a connection with the Milwaukee, Lake Shore & Western road at a point not yet decided on. The Marquette *Mining Journal* says: "The Milwaukee, Lake Shore & Western is going to Ashland as fast as men and money can push it, and will there connect with the Northern Pacific, now in process of construction to that place. A connection with the Milwaukee road will, therefore, give the Marquette & Western and the Detroit, Mackinac & Marquette lines a through line from the Pacific to St. Mary's River, when the latter road is built through to the Sault, where it is quite certain it will go in a very short time after the other points, toward which it is manifestly reaching, are made. Once given these connections, and with St. Mary's River bridged, the system now developing on the American side will connect with the Canadian road, soon to be finished to the Canadian Sault, and the great through route between the two oceans, and along the south shore of Lake Superior, will be an accomplished fact."

Fargo Southern.—A corrected statement makes the length of this new road from Fargo, Dak., to Ortonville, Minn., 122 miles, instead of 120, as stated in our recent account of its completion.

Fitchburg.—A dispatch from Concord, N. H., says that this company is negotiating for the lease or purchase of the Nashua, Acton & Boston road, now owned by the Concord Railroad Co., with a view to competing for Nashua business. Rumors from Concord, however, are to be accepted only with much caution, and this has already been contradicted.

Grand Rapids & Indiana.—The *Commercial and Financial Chronicle* says: "A special meeting of this company, held in Grand Rapids last week, ratified arrangements which put its debt capitalization in a new condition. The accumulation of past due interest on old mortgages, amounting to something like \$2,200,000, with the bonds for the extension of the line to Mackinaw, and notes given to the Pennsylvania Railroad Co., for the use of rolling stock and other purposes, have been taken up and made part of a new blanket mortgage. The Pennsylvania Railroad Co. has relinquished its 7 per cent. bonds on the Grand Rapids & Indiana, amounting to nearly \$7,000,000, and due in 1889, and also an issue of about \$1,100,000 of 7 per cents due in 1901, and a new issue has been given in exchange for these two series and the accumulations mentioned above, the indebtedness being thus changed into a single consolidated first

mortgage on the entire road, but bearing interest at 5 per cent. instead of 7 per cent. yearly."

Illinois Central.—The Canton, Aberdeen & Nashville Branch is now completed to Aberdeen, Miss., which is to be the terminus for the present. The new line starts from Kosciusko, Miss., the terminus of an old branch, and runs northeast diagonally across the country between the main line and the Mobile & Ohio road, crossing that road at West Point and continuing beyond it to Aberdeen. The new branch is 87 miles long, from Kosciusko to Aberdeen, while the whole distance from the last-named town to the main line at Durant is 108 miles. It is expected to be a valuable feeder.

Illinois Southern & Paducah.—Contracts have been let to Caton & Daly, of Burlington, Ia., and Nicholas & Shaner, of St. Louis, for the grading of this road from Metropolis, Ill., on the Ohio River, northwest to Carbondale, about 45 miles. The contractors are to begin work at once.

Kentucky Central.—The first through passenger train over the extension to Livingston, Ky., the completion of which was noted last week, was run on July 21. Regular trains will be run over the line from this date.

Lake Shore.—This company was organized at a meeting held in Laconia, N. H., July 21. The proposed line is from Alton Bay, N. H., the terminus of a branch of the Boston & Maine, along the south side of Lake Winnepesaukee to Lake Village and Laconia, a distance of about 20 miles.

Louisville, New Orleans & Texas.—The bridge over the Homochitto River is completed, and a through train left New Orleans for Vicksburg, on July 20, carrying officers of the road and a number of invited guests. Regular trains will be put on shortly. The distance from New Orleans to Vicksburg is 235 miles.

On the 220 miles between Vicksburg and Memphis track is now laid from Vicksburg northward to Porter Bayou, 96 miles, and from Memphis southward 80 miles, leaving a gap of 44 miles to be completed, on which work is being pushed. The company hopes to have trains running over the whole distance of 455 miles between New Orleans and Memphis by October.

Mexican Central.—The Boston *Traveler*, of July 21, says: "Repairs to the bridge of this company over the Rio Grande at El Paso are now so far along that trains can, it is expected, commence running over it to-day, thereby enabling the resumption of the through business, which has been practically at a standstill for several weeks past."

"The corrected earnings of the road for June, as received on Saturday, show that the total income was \$243,443, as against \$265,344 for May. The subsidy collected up to July 1 aggregated \$2,608,727, an increase of \$61,844 since June 20. A resident director writes that the coupon funding scheme is generally well received in Mexico, and is approved as the wisest course under the circumstances. Work on the San Luis Division is interfered with by floods. The government inspector of the Tampico Railway reports travel light because of heavy rains, which also check construction."

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of July 8:

The preliminary survey will soon be finished of the line connecting Motul and Izamal with Mérida.

It is estimated by railroad men that the loss to the various lines in Texas and Mexico by the recent floods was fully \$3,000,000.

Twelve kilometres of the railway of Tulancingo being now completed, the company has put the tariff on freight between Santa Maria and Pachuca at \$1.52 per ton, which low rate will encourage the farmers to take advantage of this means of sending their produce to market.

The Governor of Campeche recently inspected the 20 kilometers constructed of the Campeche & Calkini Railroad, expressing himself as well satisfied with the work. The construction is being vigorously pushed at various points, and if everything goes smoothly, the road will be opened by September 16 next.

It is stated that before the end of the present year Perote will be connected with the capital by railway. In the course of the year 1885 the line will be extended to Jalapa, and early in 1886 it will be finished as far as Vera Cruz. As the country is flat and the grades are very easy for most of the distance, this work will be accomplished without any serious difficulties.

Miramichi Valley.—The St. John (New Brunswick) *Telegraph* says: "When the construction of the Miramichi Valley Railway, between Chatham and Gibson, was commenced, the company estimated that three years would be required to complete the work. Operations have been pushed forward so favorably this season, however, that if the Dominion and local subsidies are secured without delay it is morally certain the entire road will be completed early in the fall of 1885. About 250 men are employed on the eastern end of the line, and Messrs. Ruel & Glendinning are endeavoring to secure as large a force as possible on the western section. This week the 13-mile section between Dawes Brook and Blackville, which has been surveyed by Mr. Maxwell, will be located by the contractors, and next week the laying down of rails on the western section will be commenced. At Chatham 2,400 tons of steel rails have been received, which will be sufficient to lay about 28 miles of the road. For the sidings 300 tons of surplus iron rails from the Chatham Branch will be used. Another cargo of about 2,000 tons is expected to reach St. John shortly, to be shipped to Gibson. Some of the grades between Gibson and Blackville are quite heavy, but on the whole a very feasible route has been selected."

Mississippi Railroad Commission.—The Mississippi Court of Chancery has sustained the injunctions against the Railroad Commission in another case, holding the law to be unconstitutional and void so far as it relates to chartered rights of companies.

Nashville, Chattanooga & St. Louis.—This company's statement for June and the fiscal year ending June 30 is as follows, including all lines:

	June.	1883-84.	1882-83.
Earnings	\$161,936	\$170,660	\$2,372,186
Expenses	82,297	86,892	1,303,446
Net earnings	\$79,639	\$83,768	\$1,068,640
Interest and taxes			662,319
Surplus			\$406,321
			\$357,695

This shows for the year an increase of \$88,564, or 3.9 per cent., in gross earnings; an increase of \$59,973, or 5.9 per cent., in net earnings; and an increase of \$48,626, or 13.5 per cent., in surplus.

From this surplus last year the sum of \$106,077 was paid for improvements of the property, leaving a balance of \$300,244, equal to about 4½ per cent. on the stock.

Newfoundland.—The latest reports from this railroad on the Island of Newfoundland are that the road is completed from St. John's, the chief port of the island, to Harbor

Grace, about 80 miles, and that an extension of 20 miles to Carbonear is nearly finished. No work has yet been done on the Northern Division, which is to extend from Harbor Grace to Hall's Bay, about 250 miles, and which will be the more important part of the road, so far as the development and settlement of the island is concerned.

New York, West Shore & Buffalo.—The suit to foreclose the Terminal Co.'s bonds has been withdrawn, under an agreement that interest shall be paid, partly in cash and partly in receivers' certificates.

Northern & Northwestern, of Canada.—This company has let contracts for the work on a new extension, which will run from Gravenhurst, Ont., in the Muskoka District, 113 miles in a northerly and westerly direction to Callender, where it will connect with the main line of the Canada Pacific Railway around the north shore of Lake Superior to Winnipeg. This will open up a new portion of Ontario and serve to place the Niagara Peninsula in direct communication with the rich timber and mineral deposits to the north of Lake Superior. The contractors are Symmes, Dawson, Hendrie & Co., and they agree to grade, ballast, and construct the road and lay the rails before 1886. They will commence work at once.

Ogdensburg & Lake Champlain.—The Boston *Advertiser* says: "The Central Vermont people who recently purchased a controlling interest in the Ogdensburg & Lake Champlain Railroad have been reticent as to any detailed or definite statement of their plans for its utilization. They have said in a general way that it is a natural tributary to their road and they acquired it to prevent the diversion of traffic via St. Johnsbury. President Mills, of the Ogdensburg, did go so far as to say that he hoped by traffic arrangements with connecting roads to reduce its expenses and increase its business, but gave no details. Mr. S. W. Cummings, however, the General Passenger Agent of the Central Vermont, having recently got so far away from home as Chicago, seems to have become more communicative. He is reported by the *Times* of that city as saying that the purchase was 'for the purpose of controlling the business into the White Mountains territory.' It is also the intention to open up by this means a new through route from Boston to Buffalo and Chicago. The connection to Buffalo will be the New York Central, but the connection between Buffalo and Chicago has not been decided upon."

"Of course, if this is so, it is a new competing line with the Grand Trunk, unless the Grand Trunk's interest in the Central Vermont is sufficient to prevent the competition."

Oregonian.—A suit has been instituted in the United States Court at Portland, Oregon, to enforce the payment of the half-year's rent due by the Oregon Railway & Navigation Co. to the Oregonian Railway Co., which will at once bring up the question of the legality of the lease.

Mr. J. B. Montgomery, writing from Oregon, says that the lease was made entirely at the solicitation of Mr. Villard, and that the road remained incomplete for the very reason that it had been leased. He says: "At length Mr. Villard's proposition was accepted in Scotland. The lease was prepared by Mr. C. E. Bretherton, attorney for the Oregon Railway & Navigation Co., and Mr. Thomas Thornton, on behalf of the Oregonian Railway Co., and it was then submitted to Hon. Judah P. Benjamin, who pronounced it perfect. It was then sent to New York, and there the President of the Oregon Railway & Navigation Co. executed the lease."

"The refusal to carry out this lease, it seems to me, in view of all these facts—in view especially of the fact that the lease was solicited by the Oregon Railway & Navigation Co., and obtained through the acts of some of its very managers now—is flat repudiation; or rather, it would be if the United States courts permitted it to be done with impunity."

Pacific Mail Steamship Co.—The directors have declared a quarterly dividend of 1½ per cent., payable Aug. 1. The statement presented to the meeting by President Houston showed that the payments to the Panama Railroad Co. for the quarter ending May 31 amounted to \$60,000. The net earnings for the quarter were \$396,200, and earnings on stock were \$37,000 short of 2 per cent. for the quarter. The cash on hand was \$1,252,000 on May 31.

Pennsylvania.—This company's statement for June shows for that month, as compared with June, 1883, on all lines east of Pittsburgh and Erie:

A decrease in gross earnings of.....	\$250,697
A decrease in expenses of.....	154,581
Net decrease.....	\$96,116

For the six months ending June 30, as compared with the corresponding period last year, the same lines show:

A decrease in gross earnings of.....	\$1,019,330
A decrease in expenses of.....	612,746
Net decrease.....	\$406,584

All the lines west of Pittsburgh and Erie for the six months of 1884 show a deficiency in meeting all liabilities of \$724,490, being a decrease as compared with the same period of 1883 of \$940,164.

Pittsburgh, McKeesport & Youghiogheny.—This company will soon begin work on an extension from Connellsville, Pa., to Uniontown. This new branch will be about 25 miles long, through a rich coal and coke region.

Rochester & Pittsburgh.—Some of the stockholders of this company have combined to resist the proposed attempt to foreclose the second mortgage. A circular has just been issued in the interest of these stockholders, in which the following statements are made:

"It is understood that unless stockholders submit to an assessment, to the amount of 15 per cent. upon the par value of their stock, default will be made in paying the interest on the second-mortgage bonds which will become due Aug. 1, 1884, and that this will be immediately followed by foreclosure proceedings."

"Before the creation of these bonds an issue of about \$800,000 was made, all which were purchased by Messrs. Iselin & Co. Some time subsequently the Messrs. Iselin were permitted to cancel this purchase and to treat the amount paid by them as a loan. Thereupon the bonds which had been sold to them were returned to the company, and instead thereof, and as security for the alleged loan, they received a large amount of the present second-mortgage bonds, very considerably in excess of the amount embraced in their original purchase. The company's floating debt is now understood to amount to about \$1,400,000, which is chiefly represented by the so-called loan above mentioned, and by other loans said to have been made to the company by Messrs. Walston H. Brown & Brothers, who also hold a liberal amount of the second-mortgage bonds as security for the advances it is claimed they have made. The entire issue of the second-mortgage bonds amounts to some \$3,000,000. Shortly after these were first offered for sale it was announced that the whole issue had been taken. It is now understood that less than half were really sold. The holders of the alleged loans, to which reference has been made, now propose to compel

stockholders to submit either to an assessment or to a foreclosure by which their rights will be entirely extinguished."

The circular furthermore says: "If any just reason actually exists for threatening the company with ruin it arises from the course of the management in carrying on a war against two powerful corporations—the Erie and the Buffalo, New York & Philadelphia Railroad companies—at a time when the earnings of the company, as officially announced, were not sufficient to meet its interest."

The committee of stockholders declare that they propose to take all possible steps to resist a foreclosure, but they will act exclusively for the benefit of such stockholders as may unite with them and share in the expense of their proceeding. Charles H. Meigs, Jacob Hays and Duncan McGregor constitute the committee.

St. Paul & Duluth.—At a meeting of the board of directors of this company, on July 11, a dividend of 7 per cent. in preferred stock was declared, payable to the preferred stockholders Aug. 1, at the Fourth National Bank of New York. The 7 per cent. dividend is for 3½ per cent. due since July 1, 1882, and 3½ per cent. due July 1, 1884, and, with 14 per cent. paid in cash, makes 21 per cent. to the preferred stockholders for the three years ending June 30, 1884. The dividend in preferred stock instead of cash was authorized at the annual meeting of the stockholders, as a large proportion of the income for the past three years has been devoted to improvement of the road and equipment, and in the construction of branch lines, which appear upon the books of the company as assets unrepresented by either bonds or stock.

St. Paul, Minneapolis & Manitoba.—This company will soon construct a branch about 6 miles long from Ripon, Dak., to Casselton. When it is completed the 10 miles of track from Everest to Ripon will be taken up, being no longer required.

Work is in progress on the extension of the Portland Branch from Portland, Dak., north to Larimore on the Devil's Lake Extension. Work is also in progress on a branch from Larimore northwest to Kensington in the Park River country. The line from Portland through Larimore to Kensington will require in all some 75 miles of new track.

San Antonio & Gulf.—The committee appointed to consider the best line for a railroad from San Antonio, Tex., to some port on the Gulf of Mexico, have reported in favor of a terminus on Aransas Bay, considering Aransas Pass the best point on the Gulf for a deep-water harbor, not excepting Galveston. The distance from San Antonio is 187 miles. A committee has been appointed to solicit subscriptions, 5 per cent. of which is to be paid in at once. As soon as the legal amount shall have been received to obtain a charter, permanent organization will be effected.

San Joaquin & Sierra Nevada.—Work is in progress on an extension of this road from its present terminus at Lockford, Cal., eastward to San Andreas and thence along the Calaveras River to Altaville and the Calaveras Big Trees. Some 15 miles of the grading have already been finished. The road is now in operation from Brack Landing on the Mokelumne River westward to Lockford, 35 miles; it is of 3 ft. gauge.

Shousetown, Clinton & Frankfort.—This coal road is now nearly all graded from the Pittsburgh and Lake Erie at Shousetown, Pa., to Frankfort, 8 miles, and tracklaying will soon be begun.

Telegraph Consolidation.—An agreement for a practical consolidation of the Baltimore & Ohio, the Bankers & Merchants' and the Postal telegraph companies has been concluded, to take effect July 31. Of this agreement the *New York Times* says:

"The contract provides for a pooling arrangement which shall last for 25 years, and under the terms of which each company is to receive about an equal percentage of the earnings. Each company will continue to maintain its individual organization, but the offices and working force will be consolidated and the management of the enterprise will be in the hands of the united executive committees of the three companies. No changes can be made in the policy of the consolidated system except by unanimous consent of the representatives of each company. Should any serious disagreements arise the contract provides for the appointment of arbitrators. John W. Mackay, Robert Garrett, James Gordon Bennett, and other capitalists, will be in the Joint Executive Board. D. H. Bates, President of the Baltimore & Ohio Telegraph Company, will be the Executive Manager, and G. S. Mott, of the Bankers & Merchants', will be General Manager."

"The union of these three companies brings under one control more than 16,000 miles of pole lines and 120,000 miles of wire, connecting all of the principal cities east of the Missouri River and southward as far as Galveston, Tex. The total mileage of wire of the new combination is equal to about one-third of the Western Union mileage, omitting railroad wires, but this one-third, by reaching the most important trade centres, reaches about 80 per cent. of the entire paying telegraphic business of the country, with complete facilities for handling the business. The united companies will have four lines between New York and Boston, with branches to Newport and Fall River. They will also have four lines between this city and Philadelphia, Baltimore and Washington. There will be five lines between New York and Chicago, having in the aggregate 50 wires, including the telegraphic lines of the West Shore and Nickel-Plate railroads. Two complete lines, with convenient branches, will run through the oil regions between Buffalo and Pittsburgh. The lines west and south are now being extended, and additions will be built to meet the demands of business."

"The combination includes a complete stock quotation or ticker system, which is now in operation in this city and in Philadelphia and which is soon to be started in Chicago, Boston and all of the principal cities; also a well-established district telegraph and messenger service and a complete telephone system in many of the larger cities. The entire consolidated system will be operated in connection with the Bennett-Mackay ocean cables. In this arrangement between the three companies neither assumes or becomes responsible for the fixed liabilities of the others. Their joint control and management, it is stated, will be composed of the best talent and financial strength of the three companies. The expenses of operating will be reduced as nearly as possible to the cost of running one company, and the business will be extended wherever and whenever there seems to be need for it."

"Before the signing of the contract yesterday there was a full understanding between the three companies that extension of lines now under way should be completed and paid for independent of the combination. It was stated that provision had been made by each company to raise all the money required to finish their several extensions. The Bankers & Merchants' will need about \$500,000, the Postal Telegraph Co. will need about \$255,000, and the Baltimore & Ohio Co. expects to expend about \$250,000. The actual cash cost of the property embraced in this consolidated system is estimated at about \$18,000,000. Within four months 20,000 miles of new wire were put up by the Baltimore &

Ohio Co., and 5,000 miles more are in progress of construction. The total mileage of the Baltimore & Ohio will be 45,000 miles of wire by Aug. 1.

"The Gulf, Colorado & Santa Fe Railroad, of Texas, which has been doing public telegraph business in opposition to the Western Union Co. for several years, will join the combination, and in connection with the Baltimore & Ohio will build lines to all important cities and towns in Texas."

Texas & Pacific.—This company has made public its plan for providing for the interest maturing upon its Rio Grande Division bonds and the first-mortgage bonds of the New Orleans Pacific. It is proposed to fund one-half of each of the nine next maturing coupons of the New Orleans Pacific and the Rio Grande Division bonds into a general mortgage and terminal 6 per cent. bond at par, the other half of each coupon to be paid in cash. Consolidated mortgage bondholders will be asked to fund half of four coupons, beginning Aug. 1, for same bonds, bondholders presenting coupons to get half cash, half scrip, convertible on demand into a bond. The scrip will not bear interest, as the bonds delivered will have accruing coupons attached. The new general mortgage will be for \$6,500,000, and bear 6 per cent. interest, payable semi-annually. It is expected with this assistance that the floating debt can be paid off and the road be put in condition to enable it to be operated with economy, so that it can earn fixed charges and leave a surplus for the stock. The general mortgage will be on the entire line from El Paso to New Orleans, a distance of 1,489 miles, subject to existing liens. It will be also a first mortgage on the terminal property at New Orleans, which is considered very valuable, having cost the Texas Pacific Co. \$2,000,000. The balance of the \$6,500,000 new bonds, over the amount required for funding coupons, will be used as required for new equipment and improvements.

Toledo, Cincinnati & St. Louis.—The Southeastern and the Iron divisions have been formally transferred to the purchasing committees who bought them at the foreclosure sale. The Southeastern Division committee calls for the payment of the 5 per cent. assessment, in order that the necessary payments on the purchase may be made promptly. The reorganization of these divisions will be carried through as fast as possible.

A separate receiver has been appointed for the Cincinnati Northern Division, that section having been entirely cut off from the main line by the sale of the other divisions south of Delphos.

Union Pacific.—This company's statement for May and the five months ending May 31 is as follows, including all leased and operated lines:

	May, 1884.	May, 1883.	Five months, 1884.	Five months, 1883.
Earnings.....	\$2,112,342	\$2,351,012	\$9,390,895	\$10,696,125
Expenses.....	1,169,867	1,235,097	6,057,828	5,425,304
Net earnings.....	\$942,475	\$1,115,915	\$3,243,067	\$5,270,821
Per cent. of exps.....	55.4	52.1	65.1	50.7

This shows for the five months a decrease of \$1,395,230, or 13.0 per cent., in gross earnings, with an increase of \$632,624, or 11.7 per cent., in expenses, and a resulting decrease in net earnings of \$2,727,854, or 38.4 per cent. The statement is more favorable than has been reported, although issued very late.

Land sales for the six months ending June 30 are reported as follows:

	Acres.	Amount.
Union Division.....	2,062,291	\$4,127,411
Kansas Division.....	206,381	974,546
Total.....	2,268,672	\$5,099,957

For the corresponding period last year the total sales were 447,216 acres and the total receipts \$1,739,371, showing an extraordinary increase this year. In the month of June alone no less than 453,299 acres were sold.

Vicksburg, Shreveport & Pacific.—Track on this road is now laid to Shreveport, La., completing the road. Shreveport is 96 miles westward from Monroe, which was for a number of years the terminus of the road, and 168 miles from the eastern terminus at Delta on the Mississippi, opposite Vicksburg. The full length of the road is from Delta to the Texas line, 187 miles, but the section of 19 miles from Shreveport west (which was built a number of years ago) is leased to the Texas & Pacific Co., under a contract which expires Jan. 1 next, when this company will probably resume possession.

Wabash, St. Louis & Pacific.—The *St. Louis Republican* of July 17 says: "Some time ago the Receivers of the Wabash decided not to honor any tickets purchased previous to the day when the road was placed in their hands. The order was a great surprise to the public, and especially so to the mercantile part of it, and considerable indignation was expressed over it. Nearly all of the large houses had two or more 1,000-mile tickets, which of course became worthless as soon as the Receivers repudiated them. The Wabash officials took the stand that since the road was bankrupt it was not legally bound to honor the tickets. The business houses, however, maintained that the 1,000-mile tickets were liens on the road. A number of individual holders of tickets consulted with their attorneys and decided to bring a test suit. In accordance with this resolution Henry R. Pomeroy yesterday filed an intervening petition in the United States Circuit Clerk's office, in the case of the Wabash, St. Louis Pacific Co. vs. the Central Trust Co. of New York. Petitioner in his bill states that on Oct. 31, 1883, the complainant corporation sold him a certain ticket or contract, by the terms of which the said complainant agreed to transport him, over the railroads operated by it, from St. Louis to Chicago. This division of the road is entirely within the limits of the state of Illinois. By the statutes of that state in force when the ticket was bought, any ticket, such as bought by plaintiff, must be redeemed by the road selling it, if not used. Said complainant corporation absolutely refuses to honor the contract by transporting intervenor from St. Louis to Chicago, and declines to redeem the ticket, although repeatedly asked to do so. Wherefore the plaintiff prays that the Receivers be directed to pay him \$4.70 the value of the ticket, out of any funds in their hands or out of the earnings that may accrue in the future. Or, if there be no such funds, that the Receivers be directed to instruct their servants or employés to honor or accept such ticket. The petition was referred to Edmund T. Allen, master."

Wheeling & Lake Erie.—Suit has been begun against this company asking for the foreclosure of the first mortgage and a receiver has been appointed in the case. Mr. M. S. Woodford, General Manager of the road, has been appointed by the court to that position. The present suit results from the financial difficulties of Commodore Garrison, who owned nearly all the stock of the company. The road extends from Toledo, O., to Valley Junction, a distance of 157 miles; it was projected a number of years ago, but was only completed last year. The first mortgage bonds amount to \$3,500,000. Some work has been done on an extension from Valley Junction to Wheeling, but it is not completed.